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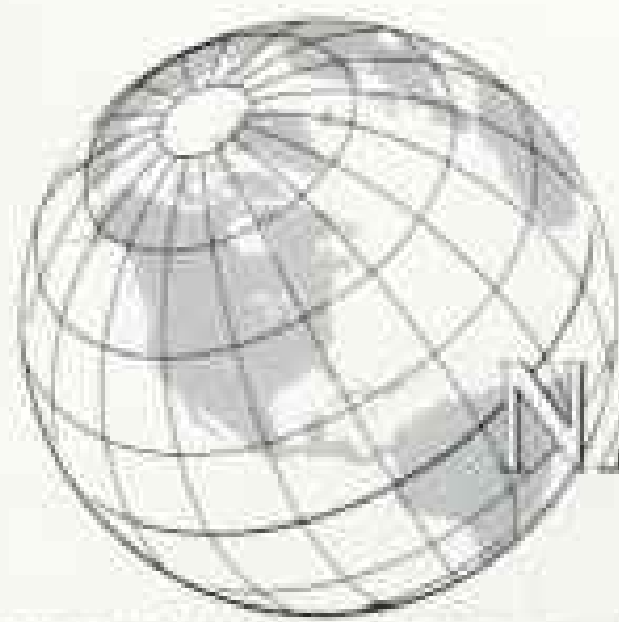
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June, 1967

# NATIONAL GEOGRAPHIC

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## ILLINOIS The City and the Plain

By ROBERT PAUL JORDAN

National Geographic Senior Staff

**S**HE RODE HIGH against the long pier jutting into Lake Michigan, this trim ship from a distant Communist country, with her bow pointing at Chicago's pinnacled skyline. Unbidden but intrigued, I climbed the Yugoslavian freighter's gangplank.

"Welcome!" boomed shirt-sleeved Capt. Dušan Malek. Throwing on his jacket, he ushered me to an easy chair in his pleasant quarters and issued rapid orders to the steward. Soon we were served Turkish coffee, thick and black and sweet.

I sipped my demitasse beneath the firm gaze of Marshal Tito, whose photograph dominated a wall of the ash-paneled, carpeted stateroom, and pondered how to begin. The congenial young master of the M. V. *Luka Botić* anticipated me.

"Wherever I go," he said, smiling broadly, "when I tell people I am sailing to Chicago, Illinois, they don't believe. They say—'Chicago! You come in there?'"

It did seem odd to see a salty merchantman from Yugoslavia moored against a backdrop of concrete-and-steel towers in this, the Land of Lincoln. But I was to find many such anomalies while touring the State of Illinois—not the least of them Chicago itself. I spent weeks exploring this mighty metropolis which con-

trasts so markedly with the peaceful hamlets of the Prairie State.

Captain Malek described the passage that had brought him to Chicago. Six weeks earlier, he and his 35-man crew had put out from Rijeka, on the Adriatic Sea. After loading cargo at several European ports, the 504-foot motor vessel crossed the Atlantic and entered the Gulf of St. Lawrence (map, page 777).

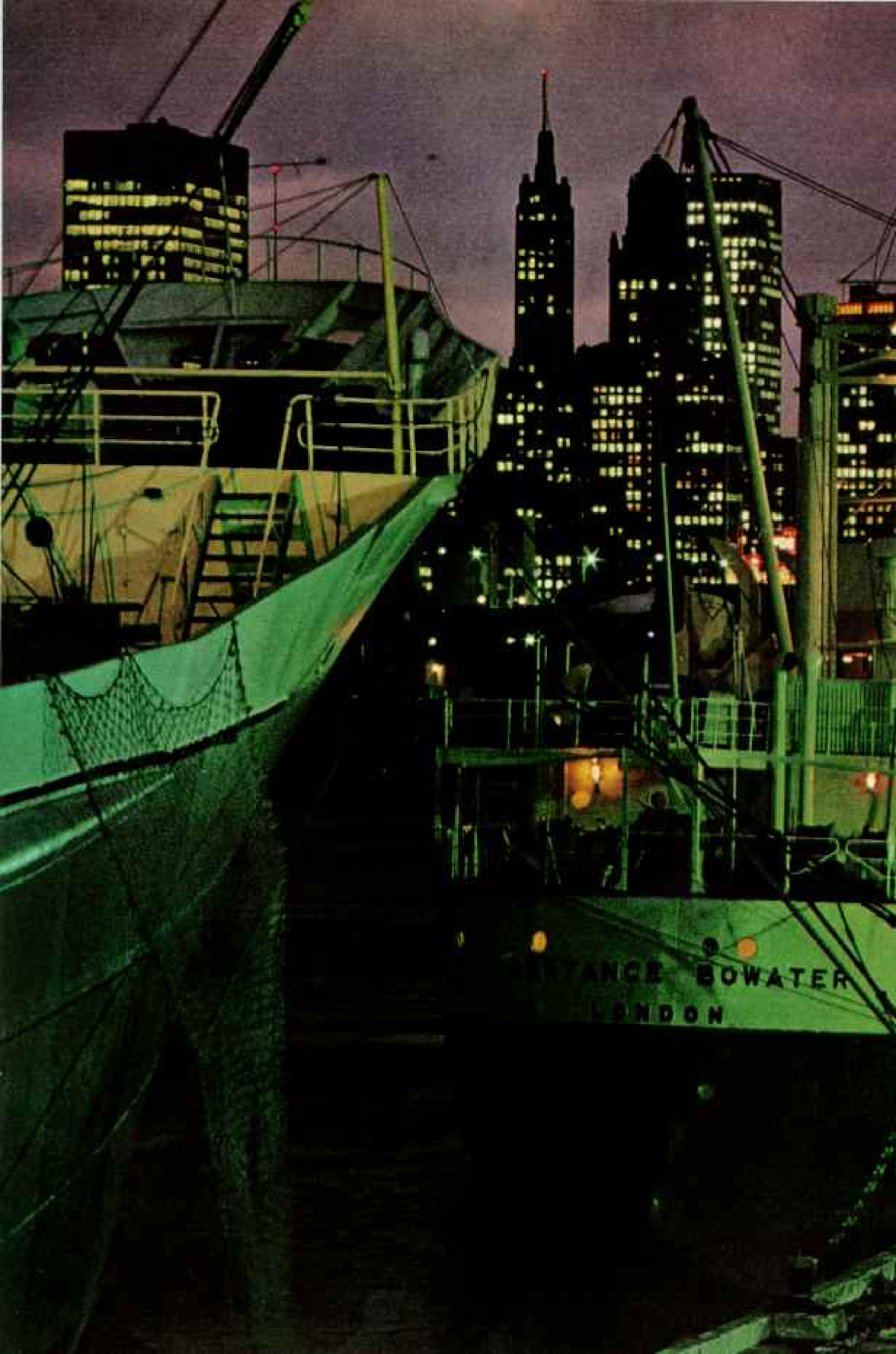
Then she churned 2,240 miles into the heart of the United States, discharging a potpourri of Old World goods along the way: wines from her homeland; motor scooters and glassware from Venice; autos, typewriters, and accounting machines from Genoa; bottled cherries from Naples; tomato paste from Lisbon.

At last *Luka Botić* rested in the water off Chicago, holds empty—but only for a few hours. Through a porthole I watched longshoremen pilot forklift trucks laden with bags of Illinois soybean meal to her side; feed for Europe's livestock.

"Nation's Freight Handler," poet Carl Sandburg called Chicago, whose towers dwarf ships at Navy Pier. Today the exuberant mid-continent merchant, linked to the oceans by the Great Lakes-St. Lawrence Seaway, reaches out for the world's freight.

400CHROME BY JAMES L. STANFIELD © N.G.S.

*Illustrations by National Geographic photographers  
JAMES L. STANFIELD and JOSEPH J. SCHERSCHEL*



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Astern, black-hulled *Aizu Maru* of Tokyo loosed three hoarse blasts and nosed for Japan, carrying tractors, canned goods, books, clothing, machinery parts, and grain from all over the bountiful Midwest.

My host gently set his tiny cup and saucer on the coffee table. "This is a good port," he said. "I make three round trips a year to Chicago. I have many friends here."

I asked Dušan Malek to add me to his list, thanked him for his courtesy, and returned to the wharf. There Capt. John J. Manley, Director of the Seaport of Chicago, joined me.

"Chicago is the world's greatest inland port," Captain Manley declared unabashedly as we strolled 3,100-foot-long Navy Pier. "Why? Because North America's two major waterways meet here: the Mississippi River system—via the Illinois Waterway—and the St. Lawrence Seaway-Great Lakes route." \*

He waved a hand at M.V. *Fair Head*, a British freighter taking on cargo. "Mark this. Since the Seaway opened in 1959, we've become one of the world's biggest ocean ports as well, even though foreign commerce is still only a small part of our total. More than 50

scheduled lines sail from here to 66 countries."

Thus from Chicago's busy wharves, along the Calumet River and at Lake Calumet Harbor as well as Navy Pier, I saw the evolving Illinois—world trader. A little later I called on Governor Otto Kerner in Springfield, the state capital. He gave me a warm handshake and a tidy summation:

"Illinois leads the Nation in combined agricultural and industrial exports. We are becoming the most international of the states."

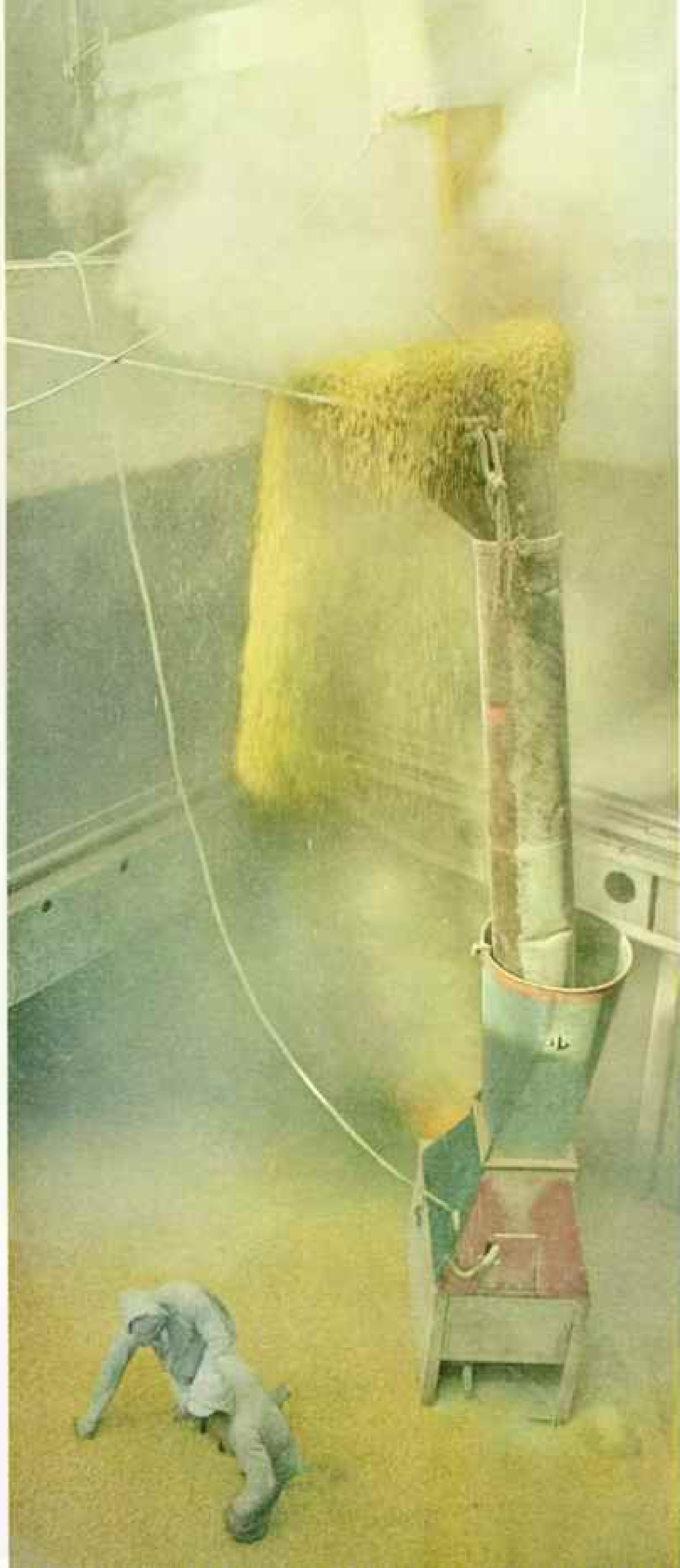
### Rural Scenes Recall Early Days

But another Illinois lives behind this cosmopolitan façade—the Prairie State of old, serene and slow to change. One sees it and takes contentment:

The broad plain swelling to the sky's rim. Wind worrying the infinity of corn. Iron "donkeys" tirelessly nodding, pumping oil from beneath rows of soybeans and stands of wheat. A fidgety lad waiting for the dark of the moon to go coon hunting. Bypassed river

\*See in NATIONAL GEOGRAPHIC: "New St. Lawrence Seaway Opens the Great Lakes to the World," by Andrew H. Brown, March, 1959.





**Cascade of corn** sends trimmers scurrying in a hold of the *Learina*, a German freighter tied up at a grain elevator in Chicago's Calumet Harbor. Protected by parkas from pelting kernels, the men "trim ship" by periodically aiming a corn distributor to load far corners. State Grain Sampler John Osborn (above) checks the quality of each cargo.

Through a barge-canal network that taps the Mississippi River system, the Lake Michigan port transships the mid-continent's wealth—grain, coal, steel, chemicals, petroleum products.

**Man's hand on earth's face:** Green plots of pasture and neat clusters of buildings break an infinity of soybean fields thatching McLean County near Bloomington. Glaciers leveled the land; wind-blown silt from the Illinois River Valley built a five-foot layer of fertile topsoil that provides the base for abundance.







towns; rip-roarers in steamboating days, drowsing in the sun as barges glide past. The murmur of small talk and creak of swings from village porches at twilight.

This enduring domain stretches nearly 400 miles long, and a bit more than 200 miles wide at its widest (map, pages 776-7). At top it lies north of Boston; at bottom, south of Louisville. About 85 percent of Illinois is farmland, and 40 different crops grow in it, including more soybeans than in any other state. Per capita income in 1965 stood 19.5 percent above the national average.

"Inland Empire," I heard it called, and I agree. I know its strengths: great natural wealth, strategic location, and energetic citizens with a bewildering variety of origins.

Next year the Land of Lincoln will celebrate its 150th birthday at thousands of events, large and small. In a sense, I have previewed the program. I have seen that Illinois is the United States in miniature.

Inevitably, the problems besetting other parts of the country also afflict it. Poor people flock to cities, seeking a better way of life, and middle-class families move to suburbs. Racial tensions snap; ghettos flame into battlegrounds. Rural and urban interests deadlock in the State Legislature. Long-depressed southern counties struggle to overcome poverty as harsh as Appalachia's.

### "Windy City" Becomes "Boomtown"

I began this story in Chicago because considerably more than half of the nearly 11 million Illinoisans live in the metropolitan area (map, page 748). Chicago is the Midwest's main office, supermarket, and grand junction of agriculture, industry, and commerce. Here lies the country's transportation hub, whether rail, highway, waterway, or air.

I remain amazed at what has happened to my old U. S. Air Force base, O'Hare Field, on the city's northwest outskirts. I was stationed at O'Hare during the Korean War with a fighter-interceptor wing. Our F-86 Sabrejets and a few civilian cargo planes had the huge base virtually to themselves.

Today, Chicago-O'Hare International Airport has become the world's busiest commercial air terminal. About 27 million passengers will use it this year. The obvious fact is that the airport is reaching the limit of its capabilities.

Poking around the overseas lobby, I got caught up in a flow of people from foreign lands. Where my outfit's jet fighters had screamed aloft—often to investigate reports of flying saucers—I now listened to a babel of

Spanish, German, French, Italian, Japanese.

It's all part of Chicago's hustle and bustle. "This is Boomtown, U. S. A.!" its boosters exclaimed—and I could understand their enthusiasm. The old "Windy City" nickname derives not only from the breezes but from the bragging of Chicago's founding fathers.

I wonder what those rugged gentlemen would make of the Windy City now. More than seven million people dwell in the metropolitan area, clustering in a lopsided beehive that wraps around Lake Michigan from the Wisconsin border 90 miles south into Indiana.

At night, flying in and out, I stared at this conglomeration many times; the bejeweled spectacle always gave me pause. Not long ago I viewed it from the air as day dawned and people headed for work. It proved a startlingly different picture.

First a fireball sun inched above the lake, emblazoning the skyline's spires and shafts. Megalopolis stirred. We lifted above Merrill C. Meigs Field (pages 760-61) in Radio Station WBBM's traffic helicopter. Soon pilot Dick Gilbert was broadcasting reports on traffic conditions to motorists below.

Beneath us slim, glass-box apartment houses spiked Lake Shore Drive. Miles of beaches and parks edged the sparkling water. Pleasure craft bobbed in marinas.

Looking north from the Loop—the business district—I made out suburban Waukegan's office buildings, 35 miles distant. Southeast 25 miles at the lake's tip I saw Indiana's alabaster sand dunes and somber steel mills. To the west the city sprawled far and flat, a cheerless prospect laced with stark rows of brick houses, thousand-tentacled railroad yards, and block-long fortresslike factories.

### One Disabled Vehicle Stalls Thousands

Everywhere my eyes fell, automobiles by the tens of thousands poured into the central city—endless columns of armor angling in on multilane superhighways.

Suddenly Dick pushed the helicopter's nose toward a freeway 750 feet below us. I spotted a disabled car there, hood raised to signal distress. Behind it swelled greater distress. Autos had backed up for a couple of miles.

"That's where the Edens Expressway joins the John F. Kennedy Expressway," Dick said. "More than 200,000 cars pass that point daily."

A good many would pass it slowly this day.

Every weekday vehicles pour in and out of Chicago like soldier ants, and mass transit hauls several hundred thousand other commuters to and from work, with a rail service

that has been called the Nation's best.

I jockeyed nervously through rush-hour traffic one morning to visit Inland Steel's Indiana Harbor Works, a 1,208-acre complex on Lake Michigan's southern shore. Production roared full blast in eight-hour, round-the-clock shifts. In 24 hours the mill would gulp as much water as a city of 100,000 uses in 60 days, and then would return most of it to the lake.

Inside the largest open-hearth shop man has built—24 giant furnaces in a row—I watched steelworkers toil in the eerie light of flickering fires, amid fountains of sparks. They wore hard hats, protective glasses, flame-resistant jackets and pants, and safety shoes.

Molten metal, white-hot at 2,900° F., flowed thickly into a 200-ton ladle, and I knew what the inside of an oven is like. My Inland Steel escort pointed at the heavily garbed workers and said, "Those men are also wearing woolen underwear—for additional insulation against the heat."

#### Chicago Leads in Steel Production

We moved on and a safety poster printed in Spanish caught my eye.

"It's a relic," the steelman said. "Puerto Ricans and Mexicans supplied part of our manpower in the 1940's. Their sons work here now. So do sons and grandsons of the Central Europeans who started up the mill in 1903. Our people live in more than a hundred towns, and some drive a hundred miles round trip to work."

Metropolitan Chicago produces more steel than any other area in the world, and more machinery. As I roamed, I learned that it also manufactures more telephone equipment, radios, TV sets, refrigerators, confections, and many other items. It used to be the biggest meat packer, but now the vast stockyards are relatively quiet. The big meat processors have moved away; most animals are slaughtered closer to where they are raised or fattened.

Chicago is the Nation's No. 1 convention host; convention spending adds up to nearly a third of a billion dollars a year. When fire last winter razed the huge exhibition hall known as McCormick Place, Chicago proceeded immediately with plans to rebuild it.



DETAILS OF NATIONAL GEOGRAPHIC PHOTOGRAPHER BRUCE SALK © N.G.S.

**Bundled against the bluster of the "Windy City,"** Mrs. William Riggs, a social worker, wears sequits of snow. Despite blizzards, sizzlers, and general fickleness of weather, Chicagoans like to point out that New York and San Francisco are actually windier.



The country's leading mail-order houses make the city their headquarters, as do some of the largest insurance companies. A noted medical center, it attracts students from throughout the world to its eminent schools, and the American Medical Association and American Dental Association are based here.

Dealing in futures at the Chicago Board of Trade indirectly establishes the price of grain all over the globe; the Mercantile Exchange determines what many of us pay for eggs,

great actress. "It is the pulse of America."

Indeed the Windy City pulsates. It reverberates, too. One sees and hears a revitalized business section taking shape as skyscrapers pop up everywhere.

As a sidewalk superintendent of long standing, I paid rapt attention to the country's second-tallest building, sprouting on swank North Michigan Avenue. The 100-story John Hancock Center will be a self-contained city, with seven parking floors, 28 floors of offices,



ENTRICHONE (ARREVE) BY BRUCE SALL; POSADARONE BY JAMES L. STANFIELD © N.G.S.

Yelling and waving in time-honored fashion, with order blanks in hand, a trader bids in the soybean pit at the Board of Trade, Chicago's grain exchange. Sign language duplicates his outcry. Palms faced inward mean he wants to buy; fingers say 50,000 bushels. Jostling and shouting in seven bowl-shaped pits, traders annually buy and sell about 90 percent of the world's grain futures.

Illinois' huge soybean output yields feed, cooking oils, and a base for paints and plastics.

Looping the Loop, a train wriggles from Wabash Avenue onto Lake Street along the "L," the elevated railway. The Loop, 35 blocks encircled by the "L," vibrates to the bustle of stores, offices, and hotels.

butter, and onions. The vast Merchandise Mart is the most spacious wholesale shopping and buying center of all.

In 1885, the 11-story Home Insurance Building, with its iron-and-steel-skeleton construction, became the forerunner of today's skyscrapers. Chicago gave us the Pullman car, cafeteria, and group insurance, among other firsts. And down the years it has given an occasional outlander a large pain. Rudyard Kipling expressed pungent dissatisfaction in 1889.

"Having seen it," declared the British author, "I urgently desire never to see it again. It is inhabited by savages . . . its air is dirt."

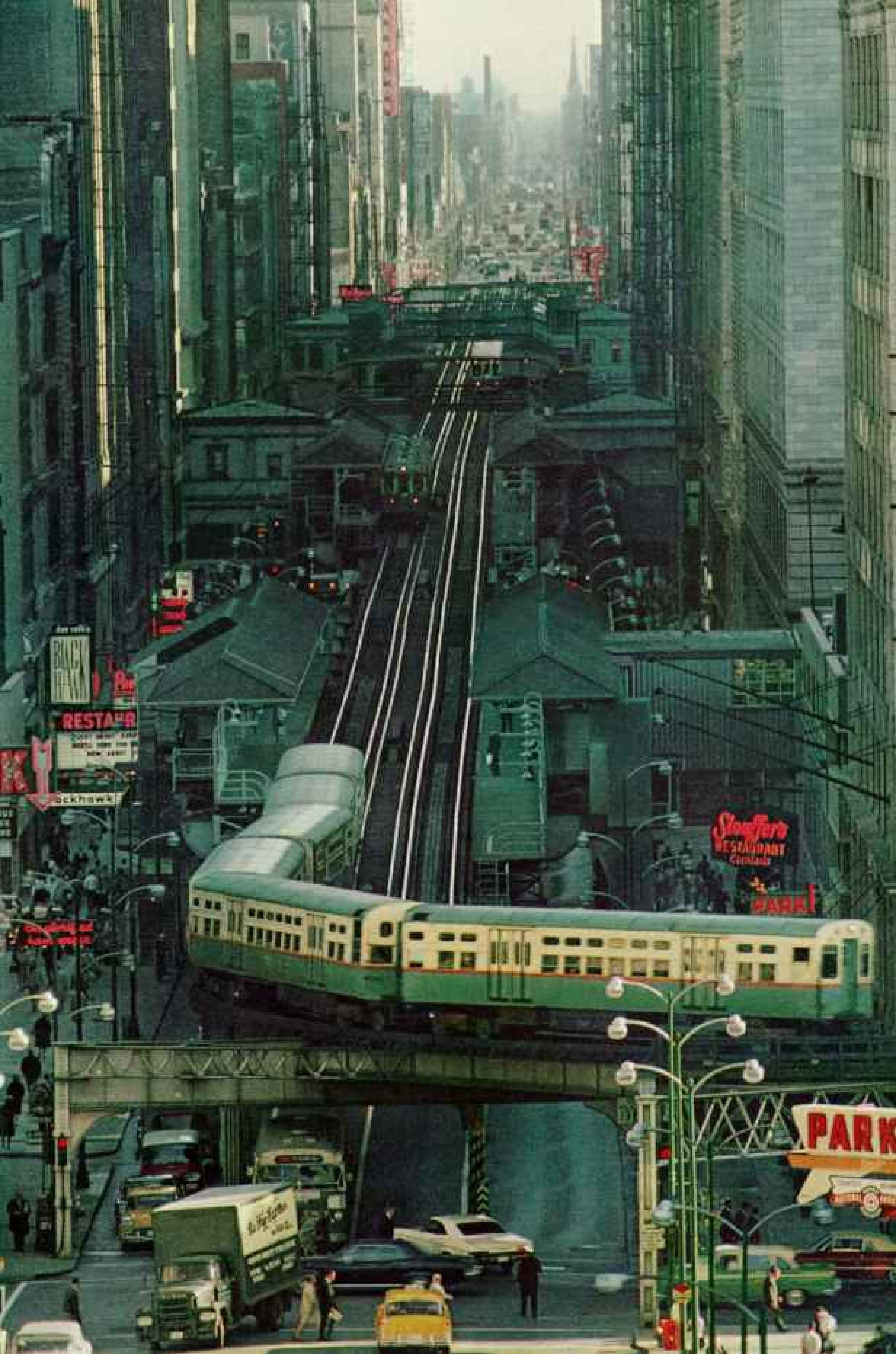
Many visitors continue to be startled by Chicago's vitality, or brashness, perhaps—characteristics which Kipling may have had in mind. But I think that Sarah Bernhardt best captured the city's essence during a tour in 1900. "I adore Chicago," exclaimed the

and 48 floors of apartments. It will include restaurants, shops, banking and recreational facilities, and an observatory.

But why, I later asked a Chicago friend, construct the *second-tallest* skyscraper (after New York City's 102-story Empire State Building)? Why remain labeled the "Second City"?

"Why not?" he came back. "Chicago has matured. We no longer wear a chip on our shoulder about New York."

One thing is certain: Chicago has challenges enough of its own, and strives to meet them. Active measures are being taken to abate air pollution. The new water-filtration plant alongside Navy Pier is the world's largest. Skid rows are bowing to the bulldozer. The police force has become one of the country's finest. People are proud of national awards received for traffic safety, clean streets, and fire protection.



Chicagoans also take pride in their cultural institutions. The Chicago Symphony ranks with the best; thousands attend its open-air summer concerts at Ravinia, north of the city. The magnificent Art Institute, famous for its Impressionist, Print and Drawing, and Oriental collections, attracts thousands more (pages 768-9). I stood before Picasso's "Nude Under a Pine Tree" fascinated both by it and by the expressions on other viewers' faces.

I wandered for hours through the Field Museum of Natural History, Shedd Aquarium, and Adler Planetarium. And I left the Museum of Science and Industry only when my legs rebelled. Splendid displays explain space technology, photography's wonders, the principles governing the universe, electronics, communications. But one of the children's favorite

exhibits also proved one of mine—the miracle of birth, as shown by chicks and ducklings hatching.

I also sampled an engaging form of culture peculiar to Chicago: Old Town. A few years ago this near-downtown neighborhood was a collection of faded Victorian houses and drab storefronts. Today its gaudy main thoroughfare sparkles with gay shops, chic restaurants, plangent night clubs (page 766), and art galleries both sophisticated and swinging. I swept through Old Town's attractions in a sea of people, rubbing elbows with ladies in mink and bearded youths in blue jeans.

How Chicago has changed! Less than three centuries ago Indians roamed here, and *She-kag-ong* was a swamp. The word means wild onion, or garlic, or skunk to some interpreters,





## Out of inferno, ingots of wealth

**P**OISED LIKE A BOATMAN poling a river of fire, a worker thrusts a thermometer into molten iron at the United States Steel Company's South Works in Chicago. Some 500 tons of liquid metal heated to 2,700° F. flow from a mixture of ore and coke seething in No. 11 blast furnace, whose great belly curves above him. Though enveloped in withering heat, he wears a long coat and mittens to deflect sparks. Cinder snapper Clinton Smith, goggles reflecting the inferno, stands by to keep slag from clogging the furnace. An open-hearth furnace nearby will convert the iron into steel.

Spinning spools of steel wire feed nail machines at U. S. Steel's Joliet plant, 30 miles southwest of Chicago. Slamming and banging with staccato din, each machine snips a point, clips to length, bangs on a head, and spits out one of 3,000 kinds of nails ranging from quarter-inch brads to 14-inch spikes.

With wharves reaching for fleets of ore-laden lakers, and waterways and railroads tapping regions rich in coal and limestone, the Chicago area reigns as steel capital of the world.



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IMAGE (PAGE) COURTESY OF (COURTESY) AND ATTACHMENT BY JAMES L. STARFIELD © N.A.S.





**Fun and fright:** Copilots show mixed emotions on the Flying Turns, which careers like a bobsled in a groove at Riverview Park. A two-mile midway, Riverview grew from a picnic area and rifle range established by the city's German colony nearly a century ago.

True to their motto, *Urbs in horto*—"city in a garden"—Chicagoans have planted hundreds of parks, hedged their prairie flank with forest preserves, and jealously protected their beach-lined lake front.



ETCHING BY JAMES L. STANFORD © N.E.A.

Tears daub the mournful face of a clown on Venetian Night, when gala balls at Chicago's seven yacht clubs enliven the Lake Front Festival. In a week-long summer celebration, hundreds of thousands view such waterside spectacles as pleasure boats parading on the Chicago River, fireboats spewing geysers aloft, and Indian war canoes racing. For King Neptune's appearance, Chicagoans dye the river white. (For St. Patrick's Day, they dye it green.)

while others translate it as strong, or great.

The first white men arrived in 1673. Explorer and map maker Louis Jolliet, Jesuit missionary Jacques Marquette, and five voyageurs, returning up the Mississippi after exploring the mysterious Father of Waters, turned into the "Country of the Illinois." The confederated tribes of Cahokia, Tamaroa, Michigamea, Kaskaskia, and Peoria, living along the Illinois River Valley, called themselves the Illini, or "the men."

Jolliet and Marquette paddled up the Illinois River across the future state, transferred to the Des Plaines River, and then portaged to a stream that flowed through marshland into Lake Michigan. They had reached She-kag-ong.

### Capital of the Midwest Takes Shape

Not until 1803 was the Stars and Stripes hoisted over the frontier trading post of Fort Dearborn, which had sprung up where the stream—the Chicago River—joined the lake. Indians massacred the villagers and garrison in 1812. The fort was rebuilt four years later.

Gradually the prairie trading post grew into a major jumping-off place for a Nation moving west. Population swelled. By 1850 there were 29,963 Chicagoans. The railroads were coming in. The city was becoming an important meat processor. Its future as capital of the Midwest was taking form.

More than 300,000 people were living in Chicago on October 8, 1871, when fire broke out in Mrs. Patrick O'Leary's barn. The blaze spread rapidly, driven by a strong breeze. In thirty awful hours the flames consumed 17,500 buildings; left 2,600 acres in ashes; took an estimated 250 lives, and made 90,000 people homeless.

Many a contemporary Chicagoan grew up with tales of the fire filling his ears. I like the little story my friend Jessie Brown, office manager for the law firm of Taylor and Kelly, tells about her great-aunt, Anna Hale Parker.

"Aunt Anna was a seamstress," relates Miss Brown. "When the fire drew near, she refused to leave her precious sewing machine, heavy and cumbersome though it was. While her house and belongings burned, she carried it several blocks to Lincoln Park and safety."

Sewing was the indomitable Mrs. Parker's livelihood—and she knew that there would be a tomorrow. Today's Chicago was forged in that great conflagration, and so was the mettle of its citizens.

I wondered if this spirit still abides. When I visited Mayor Richard J. Daley at City Hall,



I cited Carl Sandburg's bittersweet poem "Chicago," published in 1916, and asked if it still rings true.

*Tool Maker, Stacker of Wheat,  
Player with Railroads and the Nation's  
Freight Handler;  
Stormy, husky, brawling,  
City of the Big Shoulders.*

Mayor Daley leaned forward at his desk. "Chicago today," he replied in a soft voice, "is a combination of what Sandburg wrote and Burnham envisioned."

Daniel H. Burnham's mark on the city is indelible. An architect, he helped pioneer steel-skeleton skyscraper construction in the late 1880's. In 1909, his "Plan of Chicago" became a permanent influence. It foresaw some of the fundamental problems of metropolitan areas, and prescribed better transportation, parks, and residential developments. "Make no little plans..." adjured Burnham.

"We're making no little plans," Mayor Daley emphasized. "We have the greatest



ENTICHRISME (ABOVE) AND KODACHROME  
BY JAMES L. STANFIELD © N.Y.S.

Chicago's biggest booster, Mayor Richard J. Daley has presided over 12 years of revitalization through urban renewal, business expansion, and improved schools. Voters elected him last April to an unprecedented fourth four-year term.

Rookeries for winged and water craft, Meigs Field and Burnham Park Harbor lie only five minutes from the Loop. Fill created 91-acre Northerly Island, right.





natural potential—location, unlimited water supply, hard-working people—in the United States. We're in the greatest building boom in our history. And we hope to be rid of every unfit-to-live-in building by the end of 1967."

To Chicago's credit, families in the metropolis are—on average—among the world's most prosperous. Individual household in-

One can readily see why. I walked miles through decaying neighborhoods, looking at the city's effort to turn dismal slums into decent habitations. It is a gigantic job, one of the country's largest urban-renewal programs. "Nearly 20 percent of all rehabilitation in the United States is going on in Chicago," said Earl Bush, an assistant to Mayor Daley.



Alone in sight of megalopolis, a Dragon heels on Lake Michigan. The sparkling playground at Chicago's doorstep beckons bathers and fishermen, water-skiers and yachtsmen. To avoid ruining the source of its drinking water, Chicago deepened the upper reaches of the

come last year, after taxes, averaged \$10,082 (an amount which also reflects the fact that 42 percent of women work).

Still, welfare payments in the city support about 5 percent of the population, and half a million Chicagoans earn less than \$2,500 a year. More and better jobs, housing, and education—these have become battle cries here as in other cities.

Chicago can be likened to a family of neighborhoods. Negroes, who make up more than a quarter of the population, live mostly on the south and near-west sides of the downtown business section. Puerto Ricans and Mexicans congregate on the near-west and near-north. Polish-Americans reside both in southwest and northwest sections. Many of Italian descent make their homes on the near-west side.



Last year nearly 1,000 substandard buildings were demolished in blighted neighborhoods; 1,300 are being razed this year. I passed gaping areas strewn with rubble and overgrown with weeds, where housing and expressways are scheduled for construction. Unemployed men idled in doorways; refuse littered alleys and broken glass glinted in gutters.



BOATWORMS BY JOSEPH L. SCHERCHER © R.S.R.

pollution-clogged Chicago River and, in 1900, reversed its flow—out of Lake Michigan through a canal to the Mississippi basin.

Occasionally a bright, modern school building stood out among its grim surroundings. I paused to watch children romping during recess in blocked-off streets, and I enjoyed the hubbub as much as they.

"Ah, but when school's out they return to the ghetto," a newspaperman pointed out later. "School is only a temporary escape."

Next day, a few blocks southwest of the

Loop, I came upon a once-blighted neighborhood where startling new buildings spell hope to thousands of young men and women: the burgeoning campus of the University of Illinois at Chicago Circle.

Here, a little more than 75 years ago, Jane Addams began fighting for social reform and lending a helping hand at Hull House to immigrant Greeks, Lithuanians, Italians, Irish, Germans, Poles, and others. Now, although the 106-acre campus is not yet half completed, more than 10,000 students are attending classes. Ultimately, 25,500 are expected.

Hull House still stands—a brick Victorian mansion nestling incongruously in front of starkly modern Chicago Circle Center, the student union building. I paused outside the old settlement house. Perhaps it wasn't so incongruous after all, I thought. It serves as a reminder of a heritage shared by many Chicago Circle students.

The clamor for higher education has forced the state's more than 125 universities, colleges, and junior colleges to expand vigorously. Last fall the University of Illinois alone registered 42,537 students on two campuses in Chicago and the main one at Champaign-Urbana.

#### University Can't Grow Fast Enough

When I talked with the university's president, David D. Henry, I ventured that Chicago Circle might prove a solution to the education explosion there for years to come.

Dr. Henry shook his head, and cited Chicago's concentration of population. "The college-age population is even more concentrated," he said. "So—before we've even built it all—the new campus is inadequate. Now we must set about thinking, 'What next?'"

Moving on to the University of Chicago, I discovered that "What next?" means the largest fund drive in the history of American private education, a three-year campaign for \$160,000,000. The money will be used to strengthen the faculty and for new buildings, program support, and endowment.

"This," a university official said, "represents only phase one of a ten-year drive for more than \$360,000,000."

Subsequently I rode the noisy "L"—the elevated railway that circles the business district and gives the Loop its name (page 755)—to suburban Evanston. There I found that 116-year-old Northwestern University's new campus rests on a foundation of sand. Two million cubic yards of sand have been hauled



RETRACED BY JOSEPH J. SCHIFFEL (ABOVE AND BELOW) © N.A.S.





## Vision of Illinoisans sets pace for Nation

THEY SPEAK, men of this cornucopia called an "Inland Empire," and America listens.

His voice sonorous, his hair often tousled, eloquent Everett McKinley Dirksen (below) has won nationwide affection as Minority Leader of the U. S. Senate.

Scion of Chicago's great merchant family, Marshall Field scans a copy of the *Chicago Daily News*, part of Field Enterprises, Inc., a far-flung education and communications empire.

Civil rights leader Albert A. Raby heads the Coordinating Council of Community Organizations, which broadens opportunities for Chicago's million-strong Negro population.

Greeting a young constituent, two-term Governor Otto Kerner joins a parade at the Springfield State Fair. He formerly served as a judge.

Dr. Charles B. Huggins displays a molecular model of a cancer-producing coal tar. Discoveries in hormone treatment for cancer won the University of Chicago professor the 1966 Nobel Prize for Medicine.

Youthful industrialist Charles H.



STYACROME (OPPOSITE SPREAD) AND FODACROMES BY JAMES L. STARFIELD © N.S.P.



Percy, making a point by word and gesture, achieved national stature with election last year to the U. S. Senate.

Favorite paintings surround chairman Ben W. Heineman as he talks with fellow officers of the Chicago and North Western Railway. Architect of Chicago's crack commuter service, he plays a leading role in civic affairs.



by barge from the Indiana dunes and dumped where Lake Michigan laps the tree-vaulted, grassy grounds. An outer ring of steel and rocks keeps the lake out. I hiked across the James Roscoe Miller Campus: 74 acres of new land for learning (page 774), which nearly doubles the original area.

By now the pattern was plain to me: "What next?" is the story of Chicago. And I know that Boomtown, U. S. A. will boom on. The tiny suburb of Weston, for instance, has been selected as the site of the Atomic Energy Commission's giant \$300,000,000 atom smasher.

Someday, city planners told me, they hope

to remove the elevated railway from downtown, opening up several major streets. Someday, they hope to consolidate Chicago's railroad terminals; wastefully, the city now has six taking up extremely valuable land downtown.

Development plans are being drawn for a 16-block lake-front area along the Loop and near-south side now occupied by parking lots, railroad tracks, and warehouses. In their stead will spring towering office buildings, apartment houses, hotels, and the other appurtenances of the modern city.

Chicago's slogan, I think, tells it all: "I Will!"



What, then, I wondered, of Illinois? Chicago stands as a monument to man. But nature still fosters the Prairie State.

Subtropical forests and inland seas once blanketed the mid-continent by turns, creating immense beds of coal, pools of oil, and extensive deposits of other minerals. Then glaciers repeatedly crept down from polar regions, flattening hills, filling valleys, laying down a rich alluvial soil.

The sight of this land thrilled Father Marquette. "We have seen nothing like this," he wrote in his journal 293 years ago, "... as regards its fertility of soil, its prairies and woods;

**Night life as you like it:** Foam-capped steins and high-decibel jazz flavor the Old Town Gate, a cabaret in Chicago's bohemian Old Town. Once a decaying cluster of Victorian row houses centered around Wells Street, Old Town today presents an appealing potpourri of restaurants, pubs, galleries, and specialty shops. In the evening, fun-seekers crowd gaslit streets, and nightclubs resound with Chicago's distinctive jazz.

Svelte singer Eartha Kitt packs the Empire Room of the Palmer House, one of the Loop's most renowned hostelrys.

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PHOTOGRAPHY (JELLY) BY BRUCE DALL; SODALHOUSE BY JAMES L. STANFIELD © K.L.S.





its cattle, elk, deer, wildcats, bustards, swans, ducks, paroquets, and even beaver."

Nearly a century and a half later, pioneers who waded waist-deep in lush grasses that spread beyond view dubbed it the "Prairie State." When they put their crude wooden and iron plows to the sod, the gummy earth stuck. Many a settler gave up, loaded wife and children in the covered wagon, and rolled west in search of more friable land.

Today's farmers call that thick, fertile soil "gumbo," and Illinois contains some of the Nation's most valuable farmland.

You begin driving into it less than an hour's ride from downtown Chicago. From the superhighway the panorama of dairy farms—white-fenced, white-barned, green-pastured

—fills the eye. When you turn onto a country road, it becomes an aisle cutting through a tall forest of corn.

Not far beyond Chicago the somber spoils of strip mines also begin to rise above the plain: desolate ridges tossed up by huge shovels as they gouged the earth to bare the coal beneath.

Then, continuing south a few hours, you reach the oil fields. When the oil boom was at its height back in the 1930's, you could read a newspaper at midnight by the light of hundreds of gas flares miles away.

Coal underlies two-thirds of Illinois. Fourth among the states last year with 63 million tons mined, it has enough coal in reserve to supply the world for a century. Illinois still pumps





ENTRICHROME BY BRUCE SMILE (LEFT); EXTRACHROME (LEFT) AND BICHROME BY JAMES L. STAMFIELD © A.C.S.

oil, too. Seventy million barrels flow in a normal year from nearly 30,000 wells.

Nature brought other boons. When the glaciers smoothed the land into its gentle southerly slope, they made it easier for the Nation to expand. Wagons moved over it without obstacle, and then railroads. And the ice sheets scraped out the lake basins and created the rivers for men to use as highways of trade.

#### Progress Transforms Tiny Hennepin

On the east bank of the Illinois River, about 100 miles southwest of Chicago, lies Hennepin, Putnam County seat (map, pages 776-7). Originally it was a trading post named for Father Louis Hennepin, a Franciscan missionary, who with La Salle explored the area

**Dogfight, World War II:** Real-life British Spitfire dives on a German Stuka in the lobby of Chicago's Museum of Science and Industry. Exhibits include hatching chicks and a walk-in model of a throbbing human heart.

**Learning how a master colored,** children at the Art Institute of Chicago study Seurat's "La Grande Jatte," depicting strollers on an island in the Seine River near Paris. The institute owns one of the Nation's finest collections of French Impressionist paintings.

**Giants past and present** awe visitors at the Field Museum of Natural History. Dinosaur skeleton and mounted African elephants stand among 10 million objects in this treasure trove for sightseers and scholars.





With the city for footlights, sky-dancers twirl 52 stories high at Marina City. At this height, traffic tumult fades to silence, and the view ranges into Indiana.

World's loftiest apartments, 588-foot towers of Marina City blaze with Christmas lighting. The darkened lower 20 floors house parking spaces, restaurants, a supermarket, and a basement marina on the Chicago River. Above these, pie-slice apartments soar another 40 stories. Camera's Fisheye lens tilts the towers toward the gleaming shaft of the Wrigley Building, center, and the United of America Building, far right. A pacesetter in architecture, the city raised the forerunner of the modern skyscraper—the 11-story Home Insurance Building—in 1885, and gave birth to the Chicago School, whose followers espouse the credo that “form follows function.”

in 1679-80. At its zenith more than a century ago it was a busy steamboat port of 2,000 inhabitants. In those days, passage to Peoria, about 50 miles downstream, took four hours; the round trip cost a dollar.

I drove into Hennepin one sunny day and found that it had dwindled to a few blocks of frame houses bordering a fine old courthouse, population 400. But great change was coming. Industrial development—or, rather, explosion—soon would galvanize this sleepy village on the Illinois Waterway. Jones & Laughlin Steel Corporation has acquired 6,000 acres adjoining it and plans to spend \$150,000,000 in the first phase of building a steel mill that will employ thousands.

Main Street hadn't yet changed. It was deserted.



I parked in front of the Putnam County Bank, walked inside, and introduced myself to Ernest Bassi, the cashier.

"Where's all the activity?" I asked him.

"It's only starting," he said, showing me a \$16,000 check he'd just received in the mail.

I looked at it, puzzled.

"We had a small mutual telephone company," the crew-cut banker related, "with 200 subscribers. Each became a stockholder when he paid his \$2 membership fee. I was the pres-

ident. We charged \$5.50 a month for a business phone, \$3.20 for a four-party line, and we were making money.

"When Jones & Laughlin announced their plans," he continued, "we realized that our little common battery company couldn't serve this huge operation, so we decided to sell. We hoped to get \$25,000 or \$30,000."

I handed the \$16,000 check back to him. "You didn't do too badly," I said.

Mr. Bassi laughed. "That piece of paper represents 10 percent down. We will get \$160,000. Each stockholder will receive about \$750 for his \$2 investment."

I asked Mr. Bassi, who also sits on the Town Council, about reactions to the forthcoming steel mill.

"We have mixed emotions," he replied. "We were a quiet bedroom community. People commuted to work in Spring Valley, Peru, and La Salle, all close by. Now everything is taking on new proportions."

When I called on Mayor Frank Biagi, a bridge operator for the New York Central System, I found him up to his elbows in paper work at the kitchen table.

"We've formed a school district and a fire district," he said. "We've worked out a water district that



Bound for 5½ million members, yellow-bordered NATIONAL GEOGRAPHICS head for trimming, wrapping, and mailing. Feeder James Nelson hefts an endless procession of bundles at the R. R. Donnelley & Sons Company in Chicago, the Nation's largest commercial printing firm. Portrait of "Snowflake," first known albino gorilla, peers from the cover of the March, 1967, issue.

Five giant six-color presses, each printing more than half a million pages an hour, thunder round the clock in Donnelley's cavernous National Geographic Plant. Stacked one on top of another, magazines from a single month's press run would tower 27½ miles high—part of an outpouring of reading material that ranks Chicago as the world's No. 1 printer.

includes a sanitation system. A bigger police force will be needed. Someday Hennepin will have its own shopping center. . . ."

Mayor Biagi's voice trailed off. "It's going to be a complete change for all of us."

Today the men who explored this land for France would marvel at the expanding industrial network that is filling in the open spaces along the Illinois River Valley from the Chicago area to St. Louis.

The Illinois Waterway stretches about 330 toll-free miles from Lake Michigan to the Mississippi (map, pages 776-7). Barges glide up- and downstream carrying coal, petroleum products, grain, sand and gravel, chemicals, and iron ore (page 779). Cities along the Waterway naturally become manufacturers and shippers.

Joliet is famous for wallpaper and produces a lot of steel. Ottawa, La Salle, and Peru manufacture marbles, window and safety glass, and other glassware; clockmaking is another big industry.

The activity around Peoria and Pekin, I can testify, is enough to make a visitor blink. All told, more than 350 industries hum day and night, turning out close to a thousand products. I went to sleep

In a setting of elegance, buyer and seller talk fabrics at the Merchandise Mart, "world's largest showcase"; here 1,500 manufacturers and wholesalers display their wares in showrooms ranging from nooks to spreads of more than an acre. Covering two city blocks and rising 25 stories on the north bank of the Chicago River, the Mart operates as the largest privately owned building on earth, with 97 acres of floor space and more than seven miles of shop-lined corridors. A tide of 30,000 employees flows in and out each day.

Built by Marshall Field and Company in 1930 and later bought by Joseph P. Kennedy, father of the late President, the Merchandise Mart stands as a symbol of the city's pre-eminence as a distributor of goods.

REPRODUCED BY BRUCE DALE © W.C.S.

lulled by the champing of distant freight trains, and awoke to the insistent moans of towboats.

The Prairie State's biggest private employer, Caterpillar Tractor Co., makes its headquarters in one of Peoria's many striking new buildings. Of Caterpillar's more than 57,000 employees, nearly 40,000 work in Illinois, and most live in this vicinity.

Peoria also is a major distiller and brewer. Hiram Walker & Sons, Inc., the world's largest bourbon distiller, stands on the riverbank





RODCHORNS BY JAMES L. STANFIELD (C) NATIONAL GEOGRAPHIC SOCIETY







Tentacles of steel stabilize Northwestern University's Lindheimer Astronomical Research Center. One of the telescopes in the 70-foot turrets projects the heavens onto TV monitors. The observatory stands on 74 acres of fill—an invasion of Lake Michigan that nearly doubled the size of the Evanston campus.

**Rescue from blight:** Besieged by slums 15 years ago, the University of Chicago launched an urban-renewal program that became a national model. Here proposed buildings appear white; the Midway cleaves the university community. Faculty urban experts Philip M. Hauser, right, Morris Janowitz, left, and Jack Meltzer inspired the \$300,000,000 rehabilitation.

here. Food processing and chemical and paper manufacturing bolster the area's economy.

Rivers have always been the state's lifeblood. Pioneers built mill dams on them, and settlements grew up. Aurora, diversified manufacturing center, and Elgin, maker of plastics and electronics, started as mill sites on the Fox River.

When I reached Rockford, in north-central Illinois, I learned that it dates back to a sawmill built in 1834 on the Rock River. Rockford has grown into the state's second largest city—and it saws more wood than ever as a furniture manufacturer. But machine tools are its leading product.

West of Rockford I began cutting through rolling terrain; the leveling glacial sweep missed this region. Charles Mound, at 1,235 feet the highest point in Illinois, rises in the northwest corner. From it I looked into Wisconsin and Iowa; the Mississippi River shimmered in the distance, a silvery line dividing them.

### Galena Rests in Remembered Glory

Close by I came upon Galena, "The Town That Time Forgot," wearing its lavender yesterdays bravely and a little sadly in the hills above the Galena River.

Laid out in 1826 as men thronged to rich lead mines there, Galena (Latin for sulphide of lead) grew into a clamorous city while Chicago was still a swamp village. For years it was the most important port north of St. Louis; as many as a dozen steamboats tied up to the levee at once.

Prosperous citizens built splendid homes on terraces above the river, and the population swelled to around 15,000. In 1855 the five-story, 240-room De Soto House opened on Main Street, "largest and most luxurious hotel in the West." Abraham Lincoln spoke from its balcony in 1856.

In April, 1860, Ulysses S. Grant, erstwhile Army captain, poor-luck Missouri farmer, and unsuccessful St. Louis businessman, sailed up to Galena with his wife and four children aboard the side-wheeler *Itasca*. He clerked for a year in his father's leather store at \$600 per annum, and then marched off to the Civil War.

The city went wild when General Grant came home in August, 1865, commander of all the Union Armies. Proud citizens presented him with a stately brick home. As Republican candidate for President in 1868, Grant maintained headquarters at the nearby De Soto House and enjoyed the comfort of his handsome residence while his opponent, Horatio Seymour, stumped vigorously, to no avail.

Today, some melancholy sense of all this lingers on—the mute reproof, perhaps, of a town long jilted by fortune. I know that I searched in vain for the glory that was Galena. The lead deposits near the surface were depleted many years ago, and the railroads stole Galena's waterborne commerce. Population has shrunk to 4,400. One last indignity remains: The broad river, once 300 feet across, has silted over to a sullen trickle 30 feet wide.

I wandered into the De Soto House; it continues to welcome guests, although the upper two stories and balcony were removed in 1880 as the city declined. I strolled past the gracious old mansions, architectural heirlooms all, cameos carved into the hills. I paused in the venerable Methodist



# Lake Michigan

## ILLINOIS

**M**AIN OFFICE for the Midwest, hub of the country's transportation system, burgeoning world trader—Chicago presents a cosmopolitan face to the visitor. But beyond it awaits another aspect—the old Prairie State, which boosted a Nation on its way to the Pacific and gave Abraham Lincoln to the land in its hour of greatest danger. Illinois' motto is befitting: "State Sovereignty—National Union."



Today dynamic Chicago engages in its biggest building boom, revitalizing its famed downtown Loop. And the Land of Lincoln expands its historic role, parlaying rich soil, mineral deposits, and industries into an inland empire. Along the Illinois Waterway, which links the Atlantic to the Gulf of Mexico, barges carry the mid-continent's wealth.

Center of state that established itself in the midwestern part of Upper Mississippi Valley.

Spirits were over the principal settlement of the Sauk Indians in their territory. The Sauk and Fox Indians to whom they were led to war. Sauk War Chief Black Hawk's defeat, followed by a treaty that forced the Sauk and Fox to cede their territory west of the Mississippi River.

Quincy State capital since 1809. Lincoln's birthplace. The only one of the great cities of the midwest that is not a part of the Mississippi Valley.

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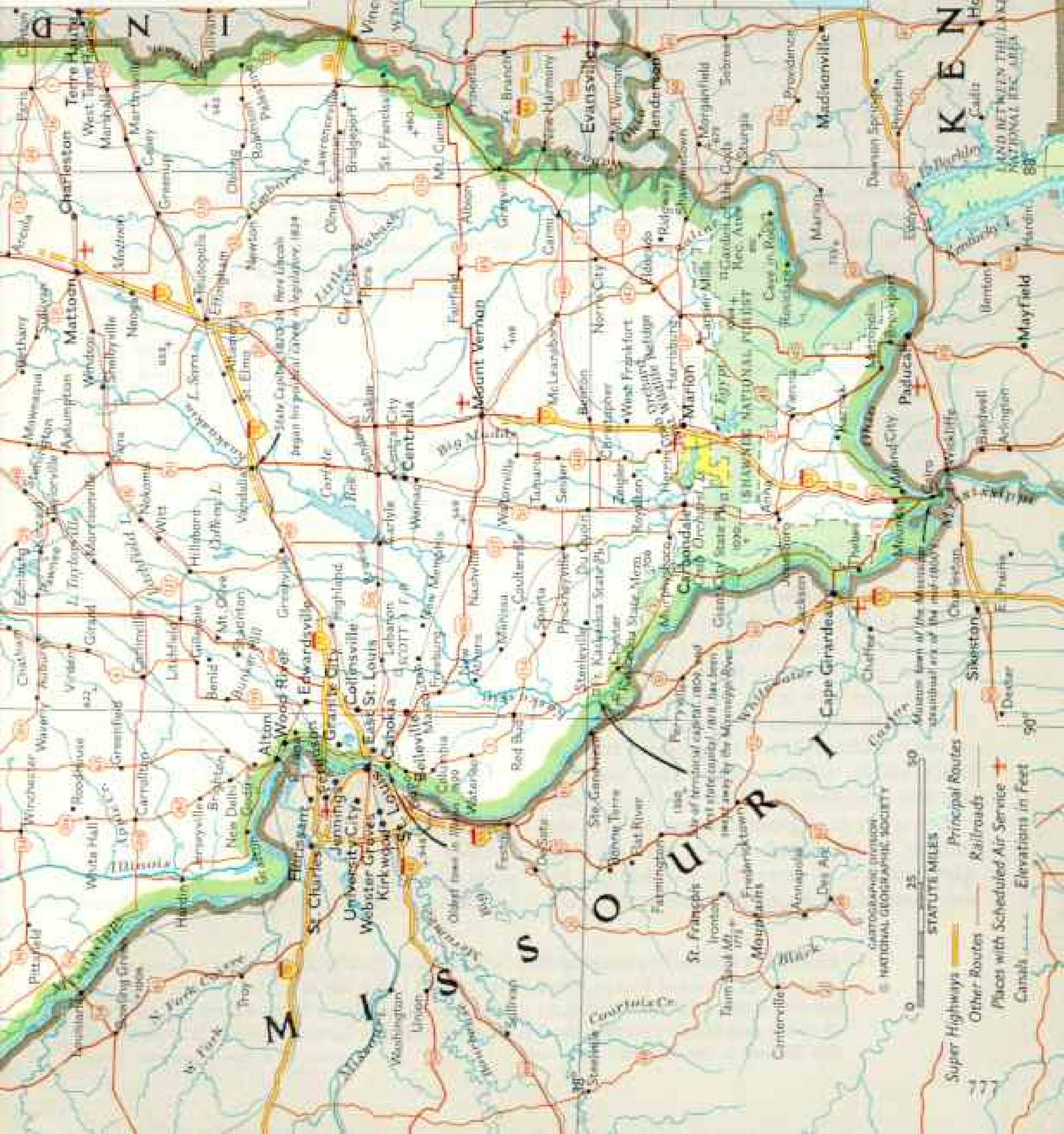
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**AREA:** 56,400 sq. mi., ranks 24th. **POPULATION:** 10,727,000, ranks 4th. **ECONOMY:** farming (1st in soybeans, vies with Iowa for 1st in corn, important in processed vegetables, livestock, and orchard crops); mining (1st in fluorapatite, 4th in coal, plus oil, clay, limestone); industry (farm machinery, petrochemicals, meat and dairy products, steel, oil refineries, electrical equipment, and machinery). **MAJOR CITIES:** Chicago (1965 metropolitan population estimate, including suburbs in Indiana, 7,237,500; city proper, 3,545,000); Rockford, 132,109; Peoria, 119,922; Springfield, capital, 84,649. **ADMISSION TO UNION:** 1818 as the 21st state.



STATUTE MILES  
0 25 50

Super Highways  
Other Routes  
Principal Routes  
Railroads  
Placets with Scheduled Air Service  
Canals  
Elevations in Feet

NATIONAL GEOGRAPHIC SOCIETY



Church; the Grant family pew was marked by a small United States flag with 48 stars.

And I savored the Grant home, a state memorial since 1932. Its long-time curator, Mrs. Sadie Allen, showed me around. The dining room, she said, was her favorite; we admired its oak table softly agleam with china and silver used by the Grants in the White House.

#### Quad Cities: Plowmakers to the World

"By thy rivers gently flowing..." begins the official state song, written in 1892. The lyrics still pertain. A short, pleasant drive down-Mississippi from Galena took me to the industrious Quad Cities—Rock Island, Moline, and East Moline in Illinois, and Davenport across the way in Iowa.

No place in the world builds more farm machinery, thanks in part to John Deere, a former Vermont blacksmith who in 1837 at Grand Detour on the Rock River hand-shaped a self-scouring steel plow that knifed through the sticky soil. Establishing a factory at Moline, Deere advertised that "The Prairie Queen" gave "unequaled satisfaction." It certainly did. Together with Cyrus Hall McCormick's reaper, manufactured at the same time in Chicago, it revolutionized agriculture.

Touring the Quad Cities area today, you pass plant after plant making farm implements and earthmoving equipment—Deere & Company, International Harvester, J. I. Case, and others. Their storage yards are jammed with brigades of brightly painted planters, corn pickers, loaders, dozers.

And plows. An automated production line can turn out a plowshare every six seconds.

Rock Island offered further proof that the more I saw of Illinois, the less I could dissociate past from present. Rock Island Arsenal spreads over 946 acres of limestone in the river, much as it has since its establishment in 1862. Indians lived there before then; to Black Hawk, a leader of the Sauk and Fox, this was "the best island on the Mississippi."

The white man practically annihilated the Indians in the Black Hawk War of 1832. Abraham Lincoln served in the debacle; his only combat, he recalled in later years, con-

sisted of "a good many bloody struggles with the musketoes."

Illinois was beginning to grow up. Pioneers from the South had used the Ohio River as their highway into the state, and settled in the lower part. With completion of the Erie Canal in 1825, New Englanders, Scandinavians, and others began swarming in via the Great Lakes, filling in the upper two-thirds of Illinois. Population swelled from 157,445 in 1830 to 476,183 a decade later.

In 1839 Joseph Smith, founder of The Church of Jesus Christ of Latter-day Saints, led his persecuted band of Mormons from Missouri to a marshland beside the Mississippi by the Des Moines rapids. They drained the land, laid out streets, built homes—often firing brick on the site—and planted orchards.

#### Historic Nauvoo Springs to Life

Nauvoo, Joseph Smith named it, saying it meant "beautiful place" in Hebrew. Mormon converts flocked there by the thousands. Within a year after its founding, between 250 and 300 brick houses had been constructed. In a short time, with more than 15,000 inhabitants, it turned into Illinois' largest city.

Just as rapidly did Nauvoo decline. The Mormons' growing strength alarmed their neighbors, who displayed increasing animosity. Prophet Smith and his brother Hyrum were shot to death on June 27, 1844, by a mob in nearby Carthage. Soon most of the Latter-day Saints set out on their historic hejira to the Valley of the Great Salt Lake.

I have seen Nauvoo in both spring and autumn, and I too find it beautiful. Today's town, population 1,000, sits on the bluff; old Nauvoo reposes on the grassy flat. In May I caught the fragrance of apple blossoms and lilacs riding the river breeze, and watched aged vineyards renewing their annual promise. In September orchards drooped with the weight of firm-fleshed Jonathans and succulent golden pears, and blue-black Concords clustered thick on the vine.

At first glance, Nauvoo seemed to me just another quiet agricultural community, its economy enhanced by wine and cheese making. Not so, I found, for down on the lowland

Through a railroad's swinging door, a towboat on the Illinois Waterway churns grain-laden barges toward Peoria. Stepped with eight locks, the Waterway winds some 330 toll-free miles from the Mississippi up the Illinois and Des Plaines Rivers to a network of rivers and canals joining Lake Michigan at Chicago. Barges in steady procession ply this lifeline in the Nation's heartland.



the old Mormon settlement is coming alive. Many of its homes and other buildings are being restored by Nauvoo Restoration, Inc., a nonprofit corporation of the church, which has acquired more than 1,000 acres. Already streams of visitors are appearing.

Over the next 10 or 15 years, Elder J. Byron Ravsten told me, 40 to 45 buildings will be restored or rebuilt.

Elder Ravsten kindly left off harrowing a field to show me about. A big, soft-spoken man, he began with a direct question: "You are a Christian?"

"Yes."

"It would be wonderful to be able to visit the homes of Christ's disciples, the Twelve

Apostles, and see how they lived, wouldn't it?"

I nodded in agreement.

"We look at Nauvoo in that light."

#### Kimball Home Suggests New England

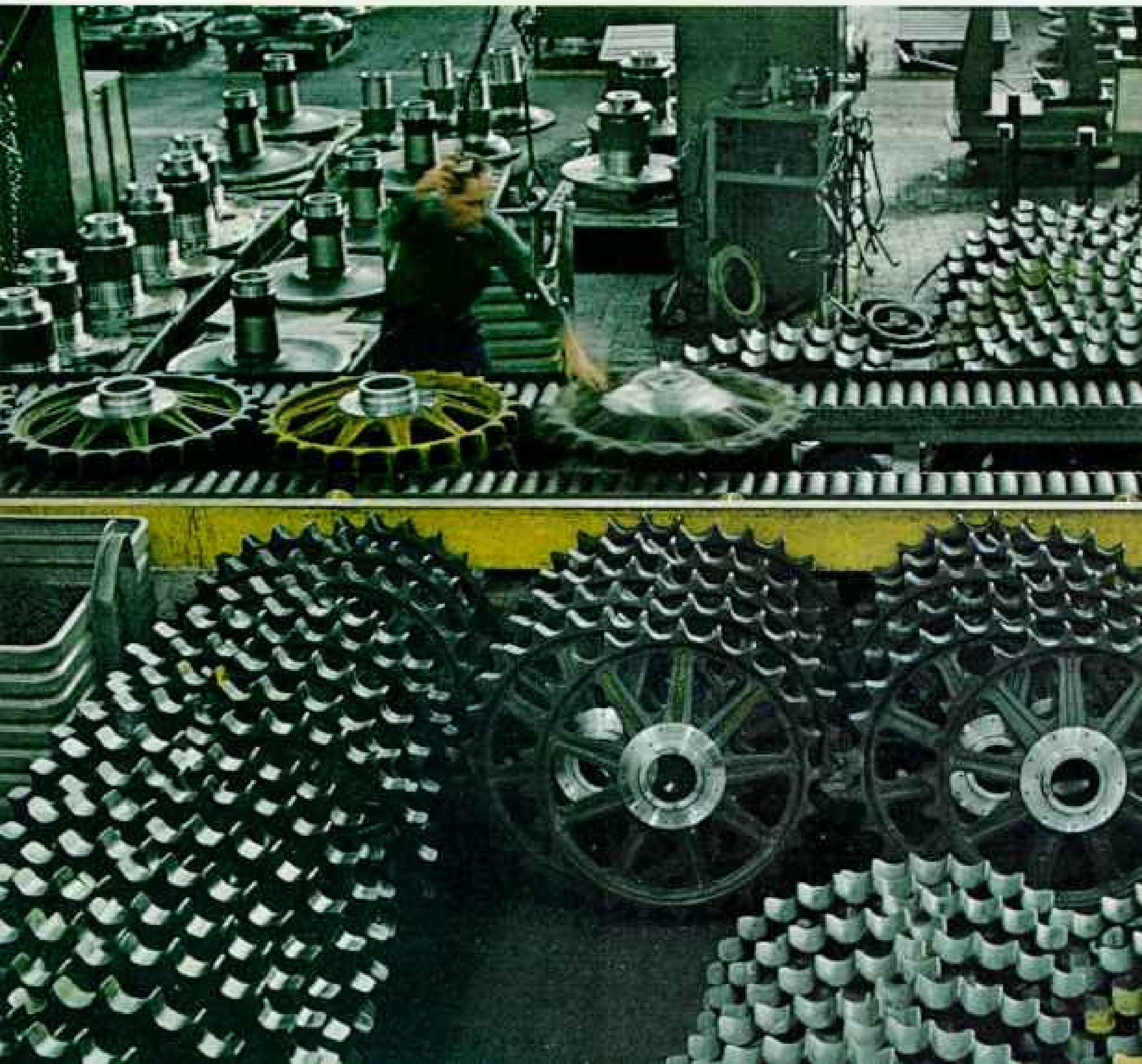
My host pulled up in front of a handsome colonial brick house, a gem of New England ancestry with a widow's walk and a white picket fence.

"This is the home of Heber C. Kimball, completed in 1845," he said. "He was one of our church's original apostles."

As I departed, it struck me that Nauvoo is becoming a new Jerusalem to Latter-day Saints, and a kind of Colonial Williamsburg to others.

Driving wheels for bulldozers crowd an assembly line at the Caterpillar Tractor Company's East Peoria plant. An attendant hoists the sprockets on a conveyor. Caterpillar employs nearly 40,000 Illinoisans—the largest private payroll in the state.

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Trimming mutton chops on his Hampshire ewe, 4-H member Stanley Cruitt awaits judging at the Illinois State Fair in Springfield. More than 4,000 4-H clubs help Prairie State youths make the most of Head, Heart, Health, and Hands.

Off the assembly line, tractors close ranks at the International Harvester Farmall works in Rock Island. Convoys of machines—plows, pickers, planters, combines—rumble from the Quad Cities: Rock Island, Moline, and East Moline in Illinois, and Davenport in Iowa, just across the Mississippi.



PHOTOGRAPHS BY JOSEPH E. SCHERAGEL © I. R. S.





ENTRICHROME (BELOW) AND KODACHROME BY JOSEPH J. ZEMINSKI, © A.S.A.



Engulfed by a sea of corn, a farmer pulls a picker near Bloomington. Cattle or hogs will glean the fodder. Illinois seesaws with Iowa as the Nation's biggest corn producer.

Dr. Kenneth Joy, a visiting British agronomist at the University of Illinois in Champaign-Urbana, washes seedlings in a glass dish before weighing them—part of a study of their ability to convert chemicals into food. Speeding this process has helped the state to double its per-acre corn yield in a decade.





I pointed my car south and turned east at Quincy, a thriving industrial and shipping center on the Mississippi.

It was September. Dogwood had changed to russet dress. The land lay full with autumn's bounty. Roadside stands offered the yield of orchard and field: apples, peaches, pears, plums, pumpkins, gourds, peppers, cider. Always cider.

Presently I reached the village of Pleasant Plains. I hoped to see an up-to-the-minute farm in operation, and Illinois' Department of Agriculture had suggested that John W. Lehmann's

land nearby would serve as a showcase.

"I don't think many people realize what modern agriculture involves," John Lehmann said as we began our tour. "It's more than just a seven-days-a-week job."

#### **Farmer Must Broaden His Scope**

He soon convinced me. Mechanized farming requires not only a large capital investment but a working knowledge of several professions. A little luck with the weather always helps.

John is a University of Illinois graduate





in animal science and agronomy. He works his 333-acre general farm with the aid of one full-time employee. Farmstead and pasture for a small herd of registered polled Herefords occupy about 100 acres; corn takes up the remaining land. His attractive blond wife Betty keeps the books—in addition to caring for their four children.

We halted beside a field of ripe corn and the farmer squinted at the rustling crop. "Because of the drought, I'll be glad to get 100 bushels to the acre here. In a good year this corn runs around 125 bushels," he said.

A little later we entered a large white barn, its pens full of fat sows surrounded by squealing piglets. "Ever hear of confinement hog raising?"

I confessed ignorance.

"We raise and sell as many as a thousand head of purebred Duroc hogs a year," John said. "We confine them here from birth to market. They never touch the ground—they're always on concrete. We control their diet and give them vitamins and antibiotics. Air conditioning ensures the proper temperature, and keeps pneumonia away."



PHOTOGRAPH BY JAMES L. STANFIELD © N.A.S.

A high-quality product results, lean and tasty. Lehmann hogs and cattle have won enough ribbons at fairs throughout the Midwest to paper a couple of rooms, I'd guess.

"What," I asked, "does it take to be a farmer today?"

John grinned. "Unceasing work." He reflected a moment.

"I have to be a veterinarian, agronomist, chemist, and nutritionist," he said. "I have to be a lawyer, practically. Farmers are liable for just about everything, like the pesticides we use.

Flying-saucer Assembly Hall hovers over its own image on a rain-drenched mall of the University of Illinois. Designed as two mammoth concrete bowls placed rim to rim, the multipurpose arena hushes one evening to a Greek drama, then rocks the next night to Illini cagers playing on a portable basketball floor. The university grounds straddle the line dividing the twin cities of Champaign and Urbana. Two Chicago branches—the Medical Center and Chicago Circle campus—swell enrollment to 42,537, making this the largest of eight state universities.

"Most of all, I have to be a businessman. I've got to keep my thumb on the market."

Farm families used to go to market every Saturday with the keen anticipation of nomads approaching an oasis, making a social occasion of the visit. Nowadays they pop in and out on weekdays, and the town square is virtually deserted after nightfall.

I learned the reason in Carlinville, a calm and prosperous agricultural center about midway between Springfield and East St. Louis. "Everybody's home watching television," said policeman Melvin Churovich. "I still work until 9 p.m., but there's nothing to do. I haven't written a ticket on Saturday night in two years."

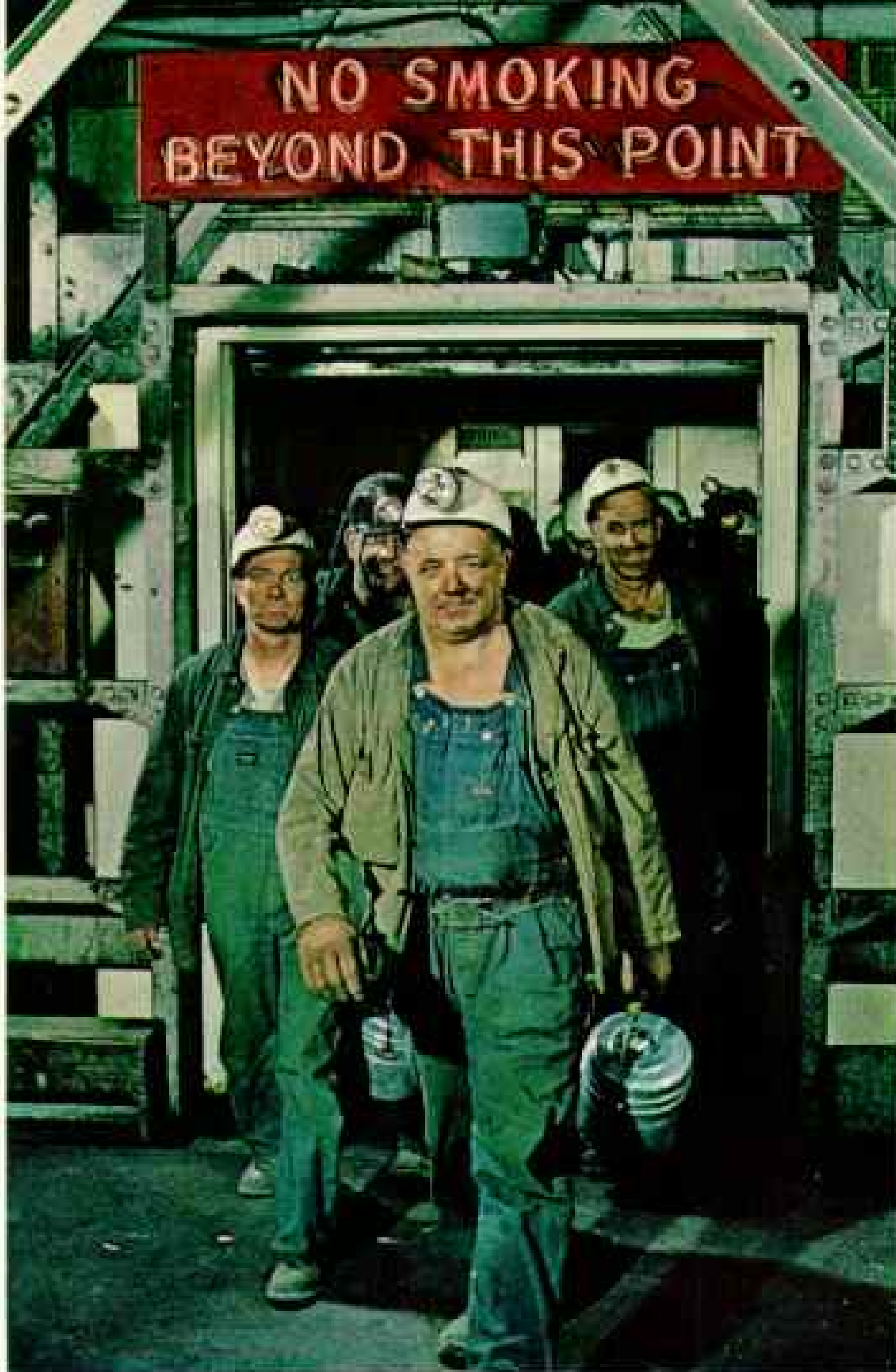
The truth is that Melvin Churovich goes out of his way *not* to write tickets. Most people leave a nickel on their car's hood when they shop. If the parking meter runs out, he cheerfully feeds the coin into it. "Creates good will," he observed.

#### Drugstore Brings Back Boyhood Days

Carlinville brimmed with good will, and conversation was easy. Strangers nodded on the street, greeting me with a "How-do." In the Elks Lodge, a wisp of a retired miner named Pat Cunningham spoke of his 54 years digging coal nearby: "In 1922 I scooped 260 tons in 12 days, loading it into carts pulled by mules. Eight-hour days they were; 92 cents a ton. I'd do it again."

Half a century fell away when I entered Ralph Surman's drugstore, still very much in business with its old white-tiled floor and apothecary jars standing on oak shelves. The labels intrigued me: calumba, cambogia, gum acacia, ipecac and opium, precipitate of calamine. Beneath were drawers filled with other wonderful things: boneset, malena salve, soapbark, Indian turnip, indigo madras, chestnut leaves, bloodroot.

I was delighted to find a pack of Cubebs for sale in Mr. Surman's fine establishment,



and to renew an acquaintance with these formidable cigarettes—tobaccoless, medicated, acrid, and unforgettable—that dates back to a misspent boyhood. Then I strolled about Carlinville.

#### **Small Community Resists Intrusions**

The United States flag presided over City Square Park and its marble bandstand (concerts on summer Thursday evenings). I circled the square—like many town squares, it is round—and wandered a block to stare at the majestic Macoupin County Courthouse, its 100-year-old painted dome looming 191 feet over the gentle countryside.

Beyond the courthouse, sunlight pierced canopies of elms and maples and oaks, and dappled peaceful residential streets. Here and there Victorian houses charmed me with their large towers on one corner, big bays, wide porches, and overhanging pediments.

On the edge of town I walked across Black-

burn College's attractive campus with President Glenn L. McConagha. He spoke proudly of the college's "Self-Help Plan," under which students work 15 hours a week, building classrooms and offices, preparing and serving food, operating the laundry, snack bar, and library, and performing numerous other chores. "Students are glad to participate," he said. "The plan lowers their expenses considerably."

Before leaving Carlinville, I dropped in on Mayor Howard C. Heinz, a frank and friendly man who operates a furniture store and funeral home established by his grandfather in 1854.

"English, Germans, and Scots settled this part of Illinois," he told me, resonant voice filling the living room of his commodious old house. "My grandfather was a 'forty-eighter' from Bavaria."

I asked how he would describe Carlinville.

"It's a very stable community," Mayor Heinz replied. "The population 100 years ago





REPRODUCED BY JOSEPH A. SCHERSCHEL (LARGE) AND JAMES L. STARFIELD (R.S.L.)

was 5,800; today it's 5,400. As a marketing and shopping center and the county seat, we serve around 18,000 people. We haven't much industry—a creamery, a glove factory, and a pipe fabricating firm."

He glanced out the front window. "It's just comfortable small-town living," he said. "We resist change. People are fiercely independent here. They want to be left alone, and they want no government interference."

"We're only an hour and 15 minutes out of St. Louis, so the big city is readily available. A lot of us work over that way, in the Alton-Granite City-East St. Louis area."

#### Heavy Industry Rules the River

"Work" indeed characterizes the East St. Louis region, where giants of industry hold sway along the Mississippi for 30 miles.

I headed south through bustling Alton. Abraham Lincoln and Stephen A. Douglas held the last of their Great Debates here on

**Forming fingers,** Mrs. James Caufield shapes new-sewn cotton at the Prairie Glove plant in Carlinville. Turning out 10,000 dozen pairs a week, the firm employs 170 townspeople—a major industry in prosperous, agricultural Carlinville.

**Festoons of bologna** fresh from the smokehouse await bagging at the Du Quoin Packing Company. Women in white vacuum-seal each ring in polyethylene; a conveyor leads to a "shrink tunnel," where heat tightens the bag. Du Quoin lies deep in the coal region of southwest Illinois.

**End of the shift:** Grime-smudged miners swinging shiny lunch pails head for the showers at the Orient No. 3 Mine near Waltonville. Manning electrical rippers instead of picks, they work 800 feet down, extracting the bituminous coal that underlies two-thirds of the state.

October 15, 1858—and a Nation heard the distant sound of Civil War bugles. The city was an important shipping point and trading center then; today it is a busy manufacturer as well, fabricating steel and brass, making munitions, chemicals, boxes and box board, and much more. Owens-Illinois, the world's largest glassmaker, began here in a single building.

Beyond Alton I passed the oil refineries of Wood River and Roxana, crossing buried pipelines that run all the way to the Atlantic, the Gulf of Mexico, and Canada. Coming into Granite City, I saw steel mills daubing brilliant orange smoke against an azure sky.

In East St. Louis, warehouses and railroad yards dominated the waterfront, and mills and factories hummed on the south side. For me, one thing only relieved this stark industrial panoply: Across the river in Missouri rose the 630-foot Gateway Arch. Tallest monument in the Nation, it loomed over the old St. Louis levee in stainless-steel splendor.\*

#### Virginia County Becomes Illinois

Just south of East St. Louis I paused in Cahokia, the state's oldest town in continuous existence, now engulfed by suburbia.

Founded in 1699 by French missionaries, Cahokia soon grew into a center of French culture. Here and at Kaskaskia, 60 miles south, *habitants* tilled fields, *bourgeois* conducted business, and *gentilshommes* directed civic affairs.

British hands took over the Illinois country in 1765, but only for a brief time. In 1778, the American George Rogers Clark and his band of 175 riflemen swept from the Ohio River to the Mississippi, winning the land and making Kaskaskia their headquarters. The region was designated a county of Virginia.

In 1787, the Illinois country became part of the Northwest Territory; in 1800, part of the Indiana Territory; in 1809, the Territory of Illinois; and in 1818, the Union's 21st state—with Kaskaskia its capital.

I drove to Kaskaskia and saw that the original village has vanished, devoured long ago by the Mississippi; a state park overlooks

the scene. Then I plunged on into the land popularly known as Egypt, the wedge of southern Illinois between the Wabash and Ohio Rivers and the Mississippi.

I peeked at the village of Thebes; it perched somnolently on a bluff, and I did not want to disturb it. In late afternoon I reached the old

\*The author described that changing city in the November, 1965, NATIONAL GEOGRAPHIC: "St. Louis: New Spirit Soars in Mid-America's Proud Old City."



Straining gracefully aloft, Canada geese break off a breakfast of corn at the Crab Orchard National Wildlife Refuge in southern Illinois. Some 50,000 Canadas migrate from Hudson Bay nesting grounds to winter on Crab Orchard's plantings of corn, soybeans, and succulent winter-wheat browse.

steamboat port of Cairo. It was napping in the Sunday sun.

The Ohio and Mississippi marry here. The delta marks Illinois' lowest point: 279 feet. Cairo, some say, got its name from the lowland's fancied resemblance to the Nile's mouth, and the region became Egypt.\*

Whatever its origin, the name has taken

\*See "So Much Happens Along the Ohio River," by Frederick Simpich, *GEOGRAPHIC*, February, 1950.

hold. In one locality, for example, I changed a bill at the Bank of Egypt, watched a movie at the Egyptian Drive-In, and dined amply at the Little Egypt Smorgasbord and Restaurant.

Now I must tell you that I think it all adds up to an engaging misnomer. True, there is the delta. But this Egypt also encompasses the smiling valleys and wooded hills of the Illinois Ozarks, and the billowing plains farther north. Coal and fluorspar mines and oil wells

ROADHOUSE BY JAMES L. STARFIELD © R.C.S.







"Bless us, O Lord, and these Thy gifts..." Grace begins supper for the George Reid family of Carlinville. Each year the table grows smaller as another of 16 children leaves home for college or marriage. Mr. Reid teaches music at the Carlinville high school; Mrs. Reid gives piano lessons and serves as organist and choir director for her church.

Framed by fronds of weeping willow, a trio of Reid girls fills the watering tub for the family cow and four sheep. Older boys divide the chore of milking; younger ones take care of the sheep as part of their 4-H training. Barn shelters the livestock, hay, the family car, and 10 bicycles—one for each young Reid living at home.

are part of it. So are peach and apple orchards and silvery lakes with Canada geese rafting on them.

Much of Egypt has strong ties with the South. I saw magnolias and bald cypresses, canebrakes and cotton mills. I heard the soft speech of Dixie blend with the twang of the rolling mountains.

Still, the people of this land remain sturdily independent. When they run out of Egyptian names like Karnak and New



Memphis, they call their towns Eldorado and New Delhi and Vienna—and pronounce them Eldor-ay-do, New Del-high, and Vie-enna. Cairo becomes Care-o, shading sometimes to Keer-o or Cay-ro.

#### Mechanical Monsters Replace Miners

I hold a warm affection for this Egypt, with its friendly people and lovely face. In all of Illinois I came upon no place more beautiful. Yet I felt an air of sadness hanging over it. People spoke of a decline in farm work, and of coal miners out of jobs for years.

Coal has been southern Illinois' major industry since the 1890's. Many mines are

producing. But unemployment ranges up to 12 percent in some counties, and averages 6 percent. When I called on David Richmond, an official of the State's Department of Business and Economic Development, he summed it up this way:

"Before a mine was mechanized, 2,400 men were needed to dig 15,000 tons of coal a day. Now, 400 miners produce the same amount."

I met Dave at his department's office in Herrin, and he took me on an extensive tour of southern Illinois. Herrin itself provided an insight. In the summer of 1922, near here, 23 men were killed in a clash between miners and strikebreakers. Then came years of severe

EXCHRONIC (OPPOSITE) AND HODCHRONIC BY JOSEPH J. SCHERRER © N.A.S.





EXTREMELY LARGE AND ROUGH BY JAMES L. STARFIELD © N.C.C.

On land her ancestors roamed, a Musk-wikiwuk maid watches a parade of braves at Rock Island's annual Indian Pow-Wow.

Mountains east in gold by autumn sunset lure visitors to the Garden of the Gods Recreation Area in Shawnee National Forest. These outriders of the Ozarks escaped the glaciers that leveled prairie Illinois.

economic depression. Today the city has brought in several industries and enjoys full employment.

A few miles north, Dave and I drove up to Freeman Coal Mining Corporation's Orient No. 3 Mine—one of the deepest in the United States (page 786).

#### Railway Probes Murky Tunnels

We donned coveralls, hard-toe shoes, and hard hats with lamps attached, and rode an elevator 800 feet to the shaft's bottom. There I saw tunnels stretching out like fingers in several directions. Assistant Maintenance Foreman Paul Kirk led us to a battery-powered personnel carrier, and we clattered interminably along uneven rails.

After about a mile, Paul halted the car and we got out. Coal dust hung in the air thick as fog. Our lamps cut three narrow paths through the murk; pinpoints of light danced in the







distance, and I heard something like the rumble of far-off thunder.

Then we walked to the source of the noise—a roaring monster called a continuous mining machine. Torrents of water spewed from its snout, keeping dust down; its huge steel teeth ripped boulders of coal from the seam and scooped them onto a conveyor which then dropped them into a shuttle car.

"A machine like this can tear out a dozen tons of coal a minute," said our escort, "and it only takes seven men to run it."

Back on top, I thanked Paul Kirk and asked what he thought of a coal miner's life. He smiled. "Well," he said, "I'm just about to retire. I guess half a century of it is enough."

#### Southern Illinois Turns the Corner

I wondered what steps were being taken to improve the region's economic outlook. In Carbondale, I sought an answer from President Delyte W. Morris of Southern Illinois University. He received me in his pleasant office on the campus.

"Not many years ago," he said, "there was a feeling of despair here. People were convinced that nothing could be done. Well, things have changed."

Some of that change resulted because S.I.U. reached out to the people, I learned. "We began by helping the public schools to help themselves," Dr. Morris told me. "Our motive was selfish—we were greatly interested in the students they would be sending us."

Today, the university's popular Vocational-Technical Institute offers 18 to 20 areas of

**Tooth-studded walls,** built to absorb sound, line an anechoic chamber at Southern Illinois University. Studying how people detect the sources of sounds, Dr. Alfred B. Copeland blindfolds a student and gives her a spin; action blurs this time exposure. As he flicks on a beep from one of three speakers, she tries to point toward the noise in the echo-free chamber. Red radial lines measure angle of error. Such research could help the blind find their way better by sounds—and answer such questions as whether hearing aids should be worn on both ears or only one.

**Seeking quiet,** freshmen sprawl on S.I.U.'s campus in Carbondale. Last March, the entire enrollment celebrated when their crack basketball team—the Salukis—won the National Invitation Tournament at New York's Madison Square Garden.







EXCHRONY (BOY) AND WIDACHROME BY JAMES L. STANTZLE © W.G.S.

study, ranging from blueprint reading to the training of medical and dental technicians. In addition, ten thousand men and women are enrolled in adult education courses. And experts of S.I.U.'s Community Development Service counsel town officials on how to attract industries.

The university has pulled itself up also, noted its slim, energetic president. "Only a couple of decades ago the student body numbered fewer than 3,000," he said. "This fall we're expecting around 18,000 students here in Carbondale and 8,000 more at our new Edwardsville campus near East St. Louis."

I left Dr. Morris, hopeful that a better day had finally come to southern Illinois. Then I headed northeast for the oil fields a few hours' drive away.

Illinois ranks eighth in the Nation as an oil producer, reason enough for me to look in on its petroleum industry. Besides, black gold

had been rediscovered a little earlier in Jasper County, a nearly depleted area.

Near Newton, I found, Union Oil Company of California had routinely redrilled a dry, concrete-plugged well—and struck oil in a previously bypassed formation.

"The rush was on," said J. J. (Jerry) Wasicek, the company's District Operations Superintendent. "Leasing activity took place for miles in all directions. In a month's time about 20 rigs were drilling. Now, four months later, about 50 wells have been completed.

"It was exciting for a while," he went on. "We saw quite an influx of cowboy hats, boots, and white Cadillacs. But the wildcatters are gone now."

I asked what had happened.

Jerry rolled up the map we had been studying. "It's a fact of nature and the oil industry that these wells can't keep flowing at their initial rates," he replied. "They decline rapidly,



Colonnaded dome of the State Capitol in Springfield, its cornerstone laid 99 years ago, rises behind a bronze Abraham Lincoln. He lived here as legislator and lawyer until his election as 16th President.



Lincoln's frontier home, New Salem strings along a weathered fence that recalls the lanky Rail Splitter. Oxen named Benny and Renny plod before a restoration of the Berry-Lincoln Store where 24-year-old Abraham failed as a merchant in 1833. Here he worked as surveyor and postmaster, studied grammar and law, and plunged into a political career that in 1837 led him to Springfield, 20 miles to the southeast. Never larger than 25 cabins, the town faded soon after Lincoln left, and had almost disappeared when reconstruction in the 1930's created this shrine, Lincoln's New Salem State Park.

Our discovery well now produces less than 100 barrels a day."

And by this time my own discovery of today's Prairie State was nearing its end. One last quest remained. Up and down Illinois I had crossed the trail of Abraham Lincoln—a trail marked by memorials and plaques. Every license plate proclaimed "Land of Lincoln." Portraits of the Great Emancipator looked out on eternity from countless walls.

Now I sought to find the spirit of the man.\* Perhaps I succeeded—in a small and very personal way—at New Salem, in Springfield, and on a windswept knoll not far from Decatur.

Abe Lincoln arrived in the little mill town

\*GEOGRAPHIC articles on Lincoln include "Vacation Tour Through Lincoln Land," by Ralph Gray, February, 1952; "Lincoln, Man of Steel and Velvet," by Carl Sandburg, and "Our Land Through Lincoln's Eyes," by Carolyn Bennett Patterson, both February, 1960.



of New Salem in 1831 and spent his early manhood there. He studied by the light of a fire made from cooper's shavings.

Today's New Salem is a superb reproduction, as painstakingly reconstructed as is humanly possible. I spent hours in the village, and from the outset it seemed to me that the young Lincoln still lived there—that he might come along any minute (below).

#### Lincoln House Holds Poignant Memory

He left New Salem in 1837, riding a borrowed horse into Springfield to hang out his law shingle. Here, seven years later, he moved with his family into the only home he ever owned. Three of his four sons were born in it and one of the "dear codgers," little Edward, died in it. The house still stands and welcomes all of us. Inside, I felt the gen-

tle strength of Lincoln, husband and father.

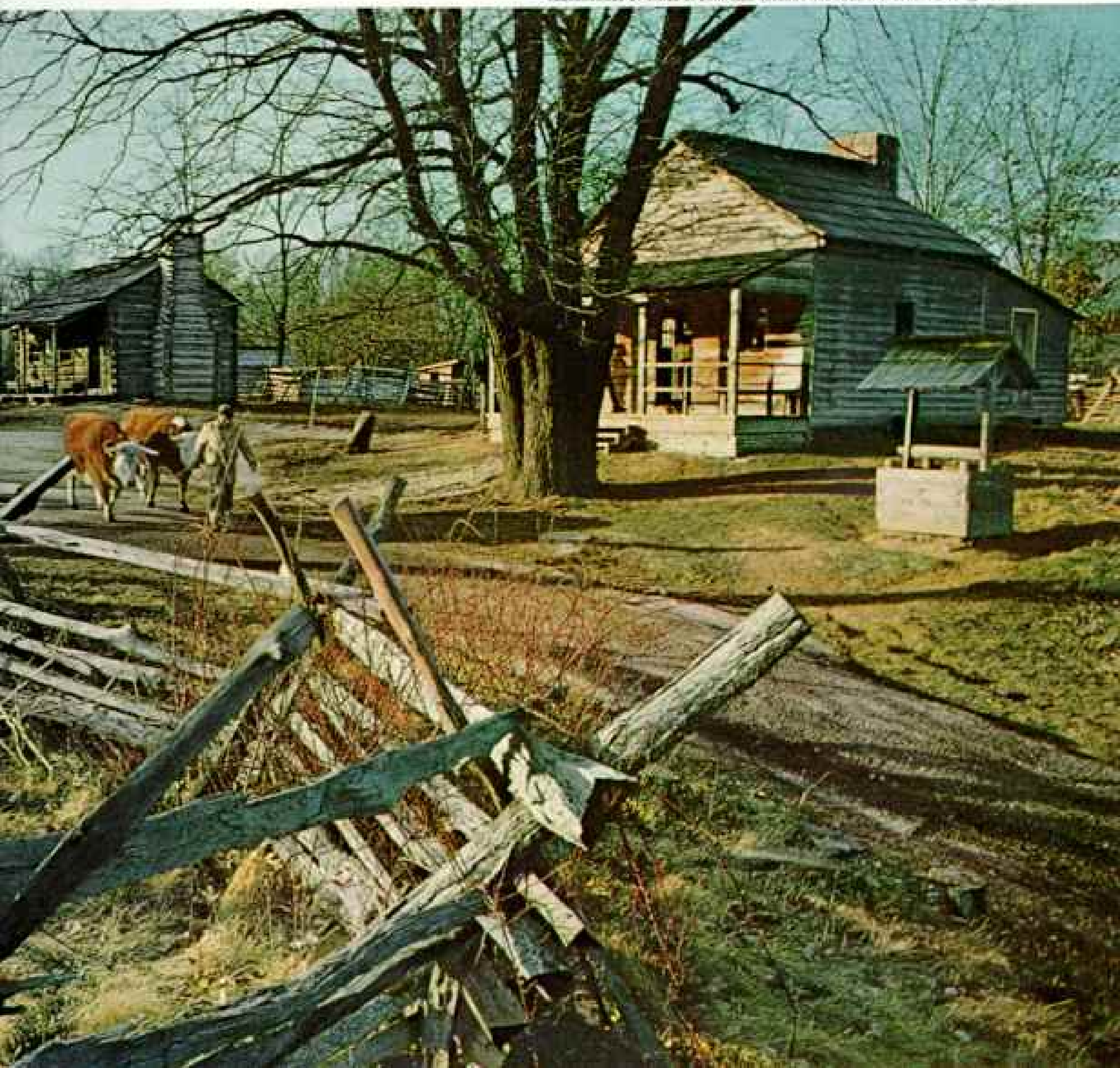
From Springfield he went to Washington in 1861 as President-elect of the United States, and returned in death just a little more than four years later. In the Lincoln Tomb, in the hush of evening, I sensed the majesty and meaning of Lincoln in his full greatness.

And the windswept knoll? It rises about ten miles southwest of Decatur, a green and peaceful tract above the sycamore-lined Sangamon River. Here, in 1830, began the saga of Abe Lincoln of Illinois. Arriving from Indiana, he and his family settled on this plot, putting up a log cabin and sowing a crop of corn.

A simple marker states as much. But beyond it I could see—as Lincoln must have seen—this good land spreading to the horizon. I think I came closest then to knowing him, and Illinois.

THE END 797

REPRODUCED BY JAMES L. STARFIELD (BELOW) AND JOSEPH J. SCHERAGEL © N.A.S.C.



# FRENCH RIVIERA

## *Storied Playground on the Azure Coast*

By CARLETON MITCHELL

Photographs by THOMAS NEBBIA

“FIRE ONE!” I muttered in the best movie hero tradition, to the bewilderment of the French sailor helping me with the launching of my new boat. I pressed *Pied-à-Terre*'s starter button, and the port engine responded with a bang. “Fire two!” The starboard engine cut in noisily.

Like a newly hatched duck, *Pied-à-Terre* swam away from the steamer that had brought her across the Atlantic. In the harbor of Marseille, my motorboat cruise of the Riviera had begun.

I was met immediately by the combination of beauty, romance, and history that makes the French Riviera one of the storied shores of the world. Ahead frowned the battlements of Château d'If, where Alexandre Dumas's Count of Monte Cristo and the Man in the Iron Mask languished in their dungeons. Beyond, like a brooding monster, crouched the limestone mass of Cap Croisette, the first dramatic geography in an amazing variety of landscapes (maps, pages 802-3).

Under and around *Pied-à-Terre* lay my favorite seascape, the Mediterranean, blue as no other sea is blue, the southern horizon an imperceptible weld with a sky almost the same color. Haze spilled over the land, completing a trinity of blue to form the Côte d'Azur, the Azure Coast, title of a 19th-century book by Stéphane Liégeard that puts into a phrase the thought of every visitor who encounters this marvelous stretch of shore between Marseille and Menton.

“Why have you changed from sail to power?” many people asked me on learning that I would not be aboard my ocean-racing yawl *Finisterre* this trip.

Invariably I replied, “Because I want to cruise cove by cove and port by port, in a boat I can handle by myself.”

I had gone to my Florida friend Dick Bertram, shipmate on many sailing passages, and said, “Build me a seagoing station wagon that will be a true single-hander.” In *Pied-à-Terre* (“a foot on the ground,” meaning a temporary lodging) he created a tough fiberglass package,

**Cornucopia from the sea**, ingredients of bouillabaisse—a savory fish soup—spill across a restaurant window above the Vieux Port of Marseille. On the Quai des Belges, fishermen spread their catch. Founded 2,500 years ago by Greek settlers from Phocaea, in present-day Turkey, France's oldest and second largest city caters to commerce, while her equally sun-blessed neighbors devote themselves to pleasure-seekers.







25 feet on deck, that proved much more than a station wagon (page 803).

The airy cabin contained a galley with sink, icebox, and stove. Opposite were a head and hanging locker for shore clothes. A folding table served for dining and as a typing desk, then conveniently dropped to become part of a comfortable berth. Awnings converted the after cockpit to a back porch. Twin 120 Mercruiser outboard-drive engines would carry me far and fast when the sea lay like a mirror, and get me safely back to port when a sudden mistral blew.

#### Mediterranean Reflects Boating Explosion

Swinging toward the old port of Marseille, reserved for fishing boats and yachts, I rounded a medieval fortress and stared in amazement. Yachts beyond count, power and sail, rimmed the quay; the boating explosion had reached the Mediterranean too.

Like a sardine looking for room in a can already packed, I circled until a sign proclaimed *Accueil Étrangers*, "Welcome Strangers." Backing into an empty slip, I congratulated myself on having no sails to furl. Docking seemed as easy as parking a car, until I became aware of a torrent of French words spouting from a gesticulating character on the quay. Luckily I knew the local idiom: "Not that way, monsieur! Haul out your bow with a buoy."

I had neglected to follow the traditional Mediterranean method of mooring, bow anchored toward the center of a harbor by a

buoy, stern tied to the quay. Now I hauled in the buoy to reach the anchor chain attached beneath it. With every link the rusty chain grew heavier and the harbor master more voluble, while mud oozed between my fingers and onto the deck. Finally making fast, I straightened to meet the grin of an Irishman on a small cutter moored alongside.

"Never you mind a bit o' muck on the deck, Yank," he consoled. "In that lot is twenty-five centuries of seafaring history."

As I swabbed down, Tom Galloway and I talked of the city's beginnings. About 600 B.C., roving Greek galleys under a young captain named Protis entered what is now Marseille harbor. Then it was a creek surrounded by forests. Legend says the Greeks arrived the day the local chief gave a banquet for warriors seeking the hand of his daughter, Gyptis.

After the feast Gyptis entered, carrying a goblet of wine; the man to whom she offered a drink would be the man of her choice. A handsome Greek caught her eye. She stopped, they looked at each other, and she proffered Protis the symbolic cup. He drank, and they were married.

The dowry of Gyptis was the land around the creek, and under Protis and his successors it became the Greek seaport and trading center of Massalia. The first link between the civilizations around the eastern Mediterranean and the forest-dwelling barbarians of Gaul, Marseille is the oldest city of France.

It was old when Julius Caesar and Pompey





"To renew my youth, I spend six weeks in St. Tropez every summer," an Italian count told the author. At this Riviera fishing village turned chic resort, action is assured: fast, frenetic, exhausting. Day after balmy day, night after starry night, the roar of sports cars and the beat of rock-and-roll bands fill the air. Beauty on a bike stops, glances back, smiles, and epitomizes a galaxy of pretty girls—film stars, chorines, princesses, and queens—who come here to see and be seen. A young beachcomber, short on cash but long on imagination, cruises the waterfront in his special land yacht, fitted out with toy duck figurehead, snow skis for rudder, and even a name—French for "quack-quack."

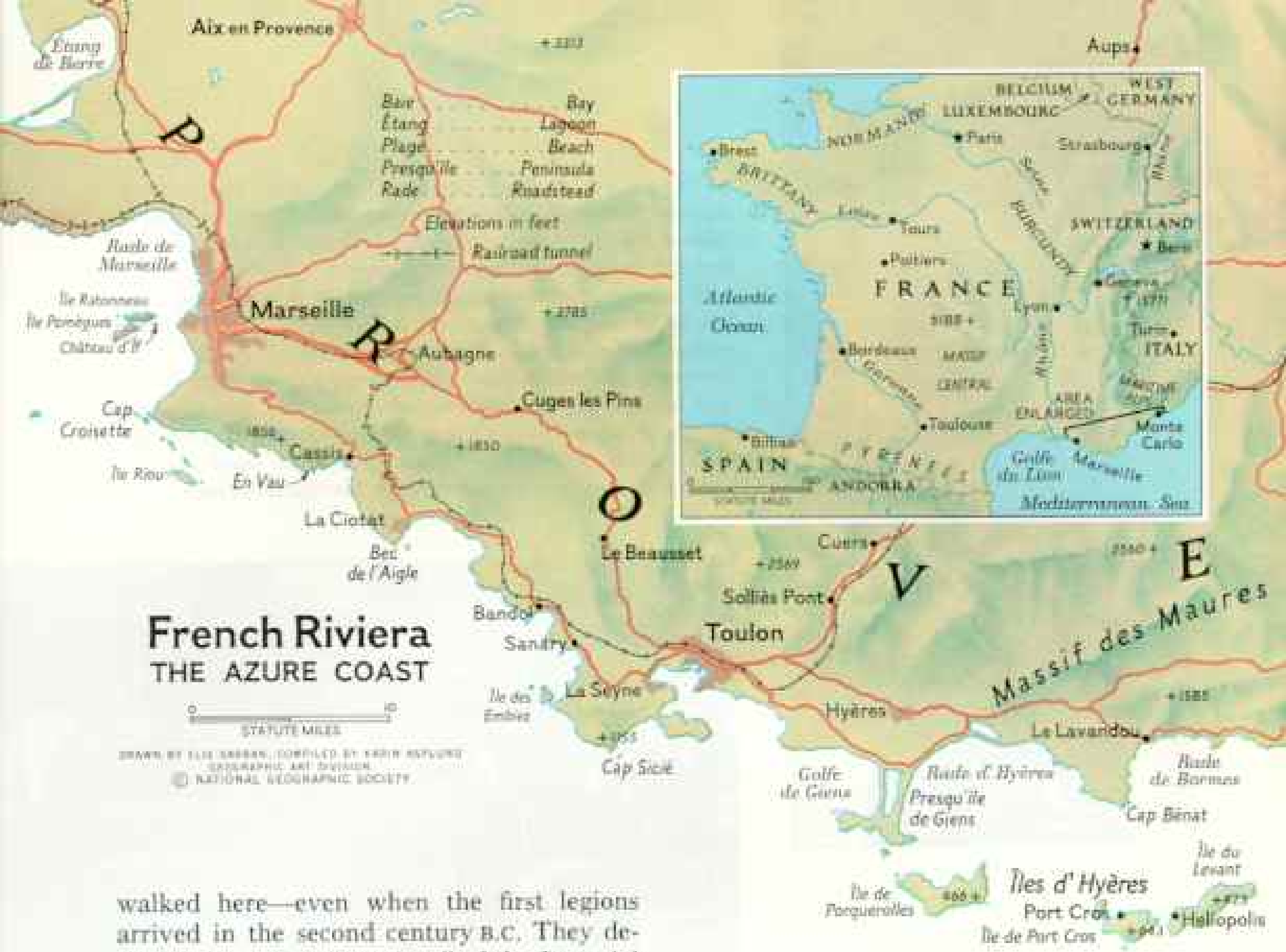


Jockeying for a racing start, two-man sloops in the Golfe de Fréjus spread their sails to warm southerlies that blow all the way from Africa. Anchored committee boat, flags fluttering from its mast and stern, marks the starting line.

XOORCHOMEX © NATIONAL GEOGRAPHIC SOCIETY







## French Riviera THE AZURE COAST

DRAWN BY ELLI SERRAN, COMPILED BY HARRY HOFFUNG  
GEOGRAPHIC ART DIVISION  
© NATIONAL GEOGRAPHIC SOCIETY

walked here—even when the first legions arrived in the second century B.C. They declared the area a “province” of the Imperial City of Rome, and the name survives in modern French geography as Provence.

Tom and I strolled the street rimming the harbor, where a torrent of small automobiles poured into the famous thoroughfare of La Canebière. Amid the bustle of this largest and busiest seaport in France, one thing troubled me. Mediterranean settlements grew up around their harbors, so that the heart of a city is its *Vieille Ville*, the Old Town, with its winding streets, medieval stonework, tiny shops, and the whiff of cooking from unseen kitchens. But the heart of Marseille seemed new.

### Nazis Obliterated Old Marseille

Puzzled, I stopped for a cup of coffee at a sidewalk cafe and asked my neighbor the reason. “The war,” he replied sadly. “The Nazis moved forty thousand people from their homes in 1943 and razed the entire area. They called the Old Town a menace to health, but we knew it was because it was a center of the Resistance. Of the old section, only these buildings facing the quay remain, a façade.”

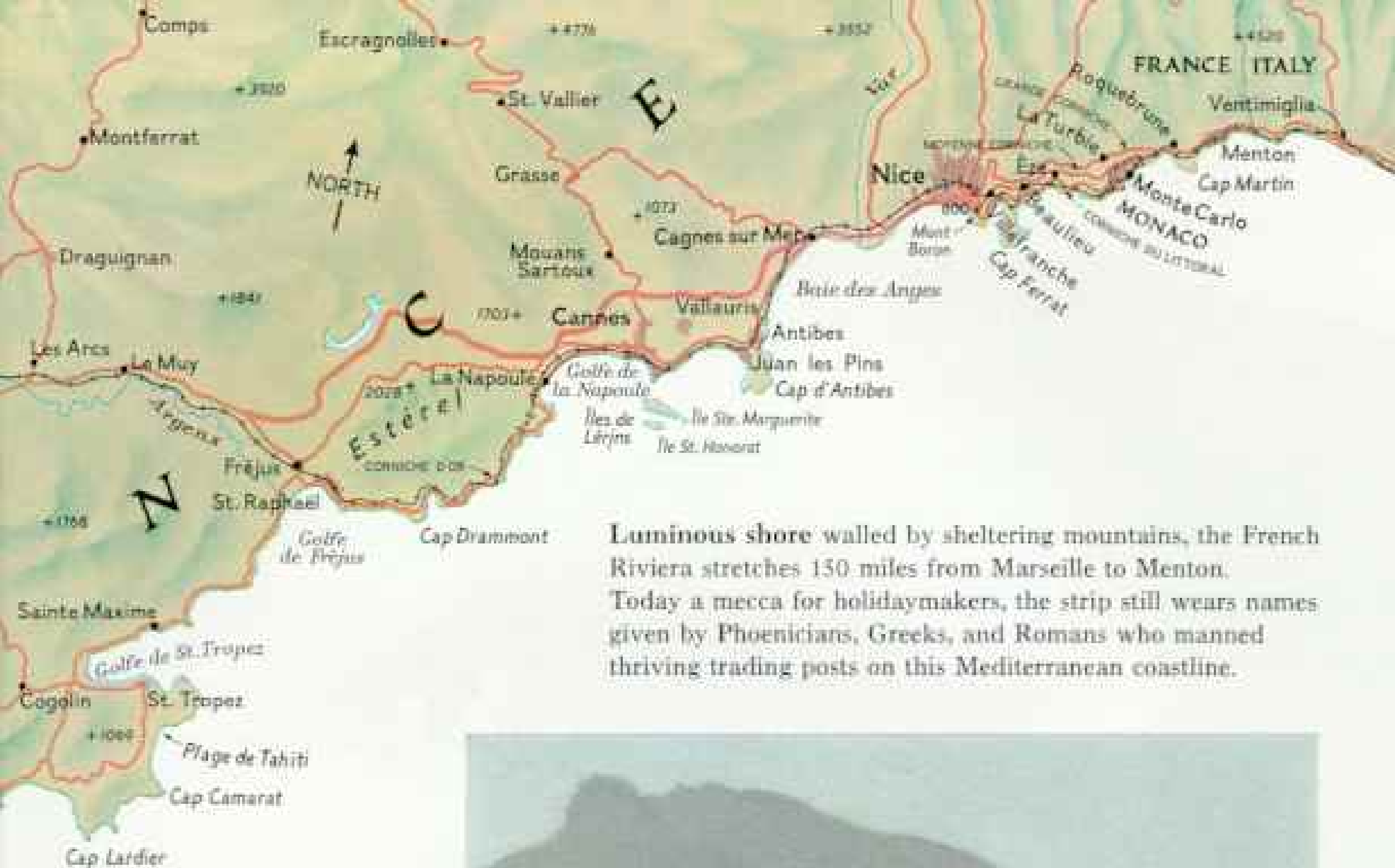
In the late afternoon, when fishermen bring in their catch, trawlers moor along the quay at the end of La Canebière, and the wives of the crew put out the fish for sale. As I paused before a display on the stern of *Notre Dame de*

*la Garde*, I noticed among the fish a pile of purplish objects looking like wrinkled prunes. When I asked what they were, the wife of the skipper split one with a knife and scooped out a morsel of meat on the back of her thumbnail. “These are *violets des roches*,” she explained, “violets of the rocks.” I learned later that they were sea squirts.

A stout gentleman at my elbow joined the conversation. “The first time you taste one you go like this,” he said, grimacing with pursed lips and closed eyes, “but you come to like them with white wine. They contain the vital elements of the sea. You become younger by ten years if you eat them.”

Tasting the tidbit proffered on madam’s thumbnail, I thought I had bitten into a piece of rubber tire that had been soaked in fish oil, with perhaps a dash of iodine added for flavor. Not even wine could have helped!

Before coming to Marseille, I had always connected the city with the national anthem of France and the fish soup called *bouillabaisse*. Now I learned that the song had actually been composed far away, in the northern city of Strasbourg in 1792 by a young officer named Rouget de Lisle, who intended



Luminous shore walled by sheltering mountains, the French Riviera stretches 150 miles from Marseille to Menton. Today a mecca for holidaymakers, the strip still wears names given by Phoenicians, Greeks, and Romans who manned thriving trading posts on this Mediterranean coastline.

"My floating station wagon," the author calls *Pied-à-Terre*, the 25-foot power cruiser that whisked him from teacup anchorages of fishermen to the yacht-jammed harbors of resorts along the Riviera.

"I wanted time for leisurely exploration, yet speed enough to take me where I wanted to go when I wanted to go," explains Mr. Mitchell.

In 1956 he sailed this coast in his ocean-racing yawl *Finisterre*, and learned that winds in the Mediterranean can be tricky or nonexistent. "I will never forsake sail," he says, "but for this cruise I preferred power."

Flying the New York Yacht Club burgee on the jack staff and the United States yacht ensign aft, *Pied-à-Terre* here skims past purple headlands near Monaco at 25 knots, almost her top speed. She keeps alive the memory of her predecessor *Finisterre* with the same colors—gray, white, and red (here darkened by shadow).





it as the battle song of the Army of the Rhine.

The music found its way to a dinner in Marseille honoring a detachment of volunteers on the eve of their departure for Paris, and every man was given a copy. At each stop on the way to the capital they sang the stirring words. In Paris crowds picked up the tune, which soon swept France. Ever since, it has been known as *La Marseillaise* because of its introduction by men of the southern city.

Bouillabaisse could have originated no-

where else, though—a combination of Provençal culinary genius and the bounty of the Mediterranean. In the Brasserie des Catalans, a waiter dressed as a *matelot*—wearing the French sailor's striped jersey and pompon cap—brought huge trays of seafood to my table while the proprietor helped me choose.

"Regard this *rascasse*, monsieur," he said, gingerly holding up a plump red fish. "So fat and so fresh! See the brightness of his eye! He will be the basis of your soup; without a





PHOTOGRAPH BY THOMAS HERRIK © N.Y.C.

rascasse the true bouillabaisse cannot be. And this gurnet. He is nice, no?"

What a repast! A steaming bowl of broth, poured over thick slices of crusty bread, subtly combined olive oil, saffron, tomato, onion, garlic, pepper, thyme, bay leaves, sage, fennel, and orange peel. *Fruits de mer*—lobster and half a dozen varieties of fish—came on a separate platter. The whole comprises one of the culinary glories of France.

Beyond Marseille the seacoast remains

Happiness is a bathtub big enough. Squealing with delight, elephants wallow in the sea at Sanary. For bathing, the behemoths take as readily to salt water as to fresh. Each summer a traveling circus visits this port town seven miles west of Toulon, a major French naval base.

much as Protis saw it. Past Cap Croisette *Pied-à-Terre* cruised under towering limestone cliffs, treeless and bleak as the North Cape of Norway. I poked into fiordlike clefts called *calanques*, drowned valleys formed by vanished streams. Then, dropping anchor deep within one named En Vau, I swam in cold, clear water sans bathing trunks, and supped on cheese, crusty bread, fruit, and a rosé wine of Provence. Only birds nesting in pines on the cliffs shared my sanctuary.

Next morning I powered around a shoulder of rock to come on Cassis, and abruptly entered a different world. Above the pastel roofs of the village a green fan of vineyards, neat as rose gardens, spread up a hillside dotted by farmhouses and tall trees, all typifying the rich beauty of Provence.

*Pied-à-Terre* came to rest with the stern a scant step from the cobbled main street of Cassis. Shutters began to swing open overhead as the town awakened, and housewives hung laundry to dry in the faint morning breeze. Moving as though half asleep, waiters were setting the tables of outdoor cafes. A cart laden with wine casks rumbled past, a dog walking in its shade. The sleek cats one sees in every French town preened on doorsteps. Shoppers gossiped, long loaves of bread protruding from their laden baskets.

#### Typical Angler Catches No Fish

It was a peaceful scene, soon made complete when a fisherman ambled down the quay. The anglers of France are a race apart. All over the nation they dangle lines more with the air of philosophers than expectant sportsmen. The newcomer was no exception. His equipment was formidable: three rods, wicker creel, grapnel, landing net, wire trap, lunch basket, and two bottles of wine.

"Excuse me, monsieur," I ventured, "but what does one catch in these waters?"

"Catch?" he repeated, in surprise. "There are many fish in the sea hereabouts."

His cork float rested tranquilly on the surface. He watched it intently. "*Regardes, monsieur, one comes.*"

I could see no movement in the bobber. He twitched the line and nothing happened.

"Perhaps not yet," he sighed, settling back again. "But it is a lovely day and it is quiet here away from my family."

I left my fisherman to his catch and with a net shopping bag set out to market. In the Vieille Ville solid citizens were going about their affairs in the manner of their forefathers. Even among other Frenchmen, the men of the Midi, the south of France, are noted for adherence to tradition. They tend dim little shops, or care for vines on hillside terraces built by the Greeks, or quest forth on the sea in boats unchanged in type through the generations. Among themselves they speak their own dialect. They season food heavily with the garlic and tomatoes dear to Latins, and cook it in olive oil introduced by the Greeks.

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They prefer their fruity rosé wines to the *grands crus* of Bordeaux or Burgundy.

Following a woman carrying a net bag similar to my own, I came on a small square. Heavily foliated plane trees shaded trestle tables. Somewhat uncertainly I took my place in front of a display of garden produce heaped in colorful abundance. When I hesitated before such profusion, an elderly couple standing close took my confusion for French politeness. Our acquaintance began on a note of dialogue straight from the old Alphonse and Gaston comic strip.

"*Après vous, monsieur,*" said the gentleman.

"*Non, monsieur, après vous,*" I replied.

"*Je vous en prie, monsieur, après vous!*" he said with a bow.



Before I could insist, his wife broke up the exchange by asking whether I was a sailor. I said I was, in a way, and both smiled.

"*Mon fils, il est aussi marin,*" declared the gentleman. "My son is also a sailor."

From then on, I was under their wing. Madame Dulac gave me a lesson in Provençal shopping: "Don't buy the big tomatoes in front," she whispered. "The little red ones in the back are better—and cheaper!" Delicately she squeezed and hefted each one before turning it over to the merchant to weigh.

We selected other vegetables and fruit with the same meticulous care, while my mentors conferred on the price like diplomats settling the fate of nations. The cheese counter was the biggest treat. From wheels, triangles, and

round bombs the *fromager* cut slivers at the direction of the Dulacs, passing them to me on the tip of a knife to sample, while all stood gravely awaiting my reaction. The people of each province of France are as jealous of the reputation of the local cheese as of their *vin du pays*, the wine of the area.

I was surprised to find as many stalls selling flowers as vegetables. "Ah, yes," said Madame Dulac when I remarked on it. "Flowers are as important as food to us. It is always so in every market."

On a sudden impulse, I bought a bouquet for a few francs. Presenting it to Madame Dulac, I was kissed on both cheeks by Monsieur Dulac as we said *au revoir*.

Returning to the harbor for lunch, I once



Grove of masts spikes the harbor of St. Tropez. In Mediterranean fashion, yachts moor with sterns to the quay, permitting the seafaring set to exchange stares with parading pedestrians, among them a casually attired sun bather carrying a freshly baked loaf of bread. On a summer day as many as 50,000 visitors crowd the cafes and boutiques along the quay.

REYNOLDS © H.A.S.





more became part of the throng that has made the Riviera the tourist mecca of Europe. During the holiday peak of July and August the Riviera becomes a vast melange of creeping automobiles, jammed harbors, crowded restaurants, and overflowing beaches.

"It is a relatively new thing, this flood of visitors in summer," Jacques Malapert, then on the staff of the famous Hôtel La Réserve at Beaulieu, would later tell me. "Until the first war people came only in winter: English lords and Russian grand dukes, escaping their own climates. The Côte d'Azur was the playground of the rich and nobly born. Hotels closed the rest of the year. Now it is the other way round, and everyone seeks the summer sun on the coast."

Leaving Cassis, I rounded the brooding

headland called Bec de l'Aigle, the Eagle's Beak, notorious for its squalls during mistrals, and came into La Ciotat to discover the unexpected. The harbor was occupied by the *Dagmar Salén*, an enormous ship flying the Swedish flag. *Pied-à-Terre* circled the vast bulk like a minnow surveying a stranded whale. The entire town behind was thrown out of scale, Lilliputian in contrast to the visiting Gulliver.

"Ships built here in La Ciotat ply the seas the world over," a yard workman told me proudly. "When we launch a new ship, we have a fête."

I looked at the tiny harbor, barely wider than a large ship would be long, and asked, "How can you do it?"

He put down a tool to gesture with both

hands. "*Regardez, monsieur.* Here we have the building ways, and there, on that point opposite, the Hôtel de Ville, the City Hall. On launching day, with the bands playing, the flags flying, people are here from all of Provence. You know why they come? To see the new ship, yes, but also to see if this time the engineers have made the calculations right—the length of the chains to stop the ship, and their strength.

"*Tiens!* The christening bottle of champagne breaks. The ship rushes into the water. It appears to be entering the front door of the mayor! Suddenly there comes a shout from the crowd. Again the ship has stopped in time. But people always come back for the next launching, just in case."

Between La Ciotat and Toulon I had my first encounter with the mistral, a dreaded wind that results when a high-pressure area over central France is paired with an extreme low over the northwestern Mediterranean Sea. The storm funnels down the Rhône Valley, gathering force and spilling out across the Golfe du Lion to affect the weather of the entire western Mediterranean region.

I left La Ciotat in bright sunshine, but dark clouds boiled



down to transform the smiling blue sea and sky into sullen gray. Suddenly it was cold. Steep-breaking waves heaped up under the lash of a northwest gale. As I raced to round Cap Sicié, *Pied-à-Terre* tobogganed down gathering swells.

#### Scuttling Deprived Hitler of Fleet

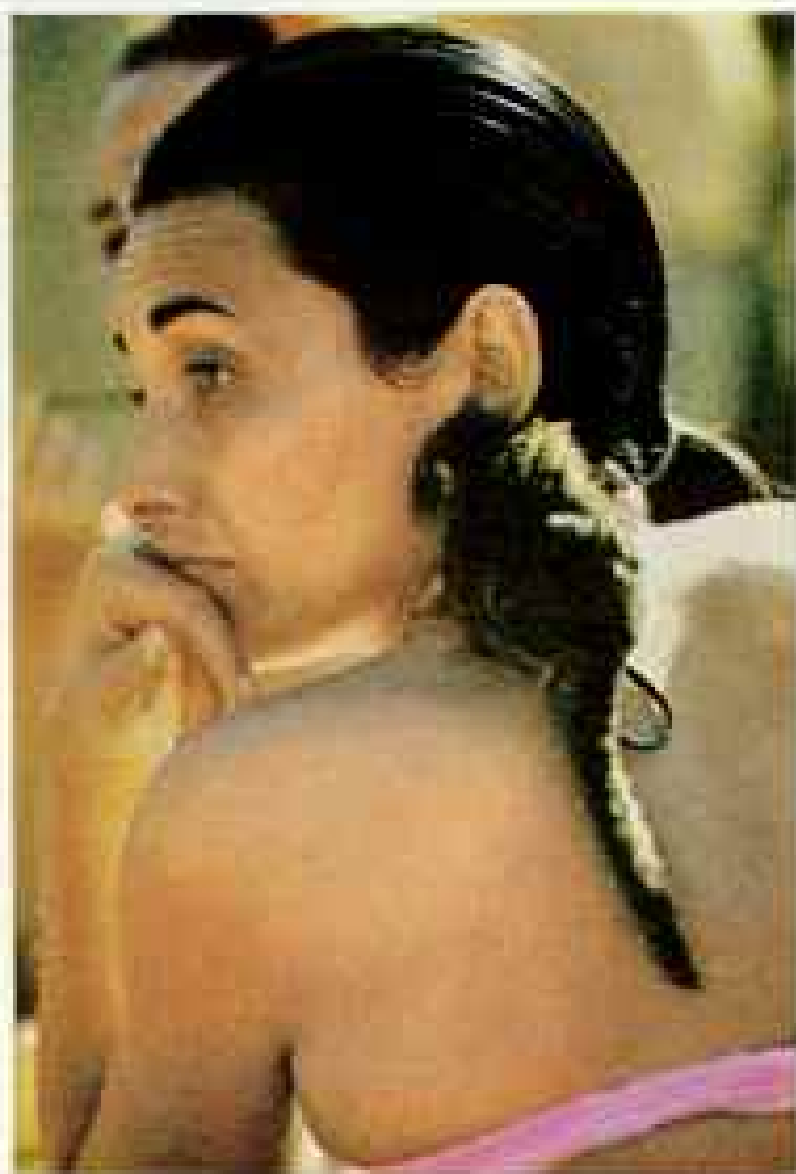
Thus I entered Toulon—France's second-most powerful naval base, after Brest—in a moment of violence. Gray skies and gray ships of war keyed recollections of the predawn drama of November 27, 1942, when Germans tried to seize the French fleet a few weeks after Allied troops landed in North Africa.

A column of Nazi tanks, secretly deployed, had burst through the outer defenses. Aboard the flagship *Strasbourg* Adm. Jean de Laborde

at first refused to believe the Germans would violate their solemn pledges, made at the time of France's surrender, not to seize the fleet. But as firing rolled closer, he signaled a single order: "Scuttle!" According to plan, oxyacetylene torches sliced through machinery, charges exploded in gun turrets, sea cocks opened. Flames and the glare of exploding magazines lighted the sky.

Daylight revealed a shattered fleet rather than the prize Hitler had sought: 77 vessels sunk or disabled. Columns of heavy smoke towered into the sky. The cruiser *Algérie* burned two days, the *Marseillaise* almost a week. In the smoke may well have gone up the Germans' final hope of invading England.

Passing under the steel flanks of France's reborn fleet, *Pied-à-Terre* entered a snug

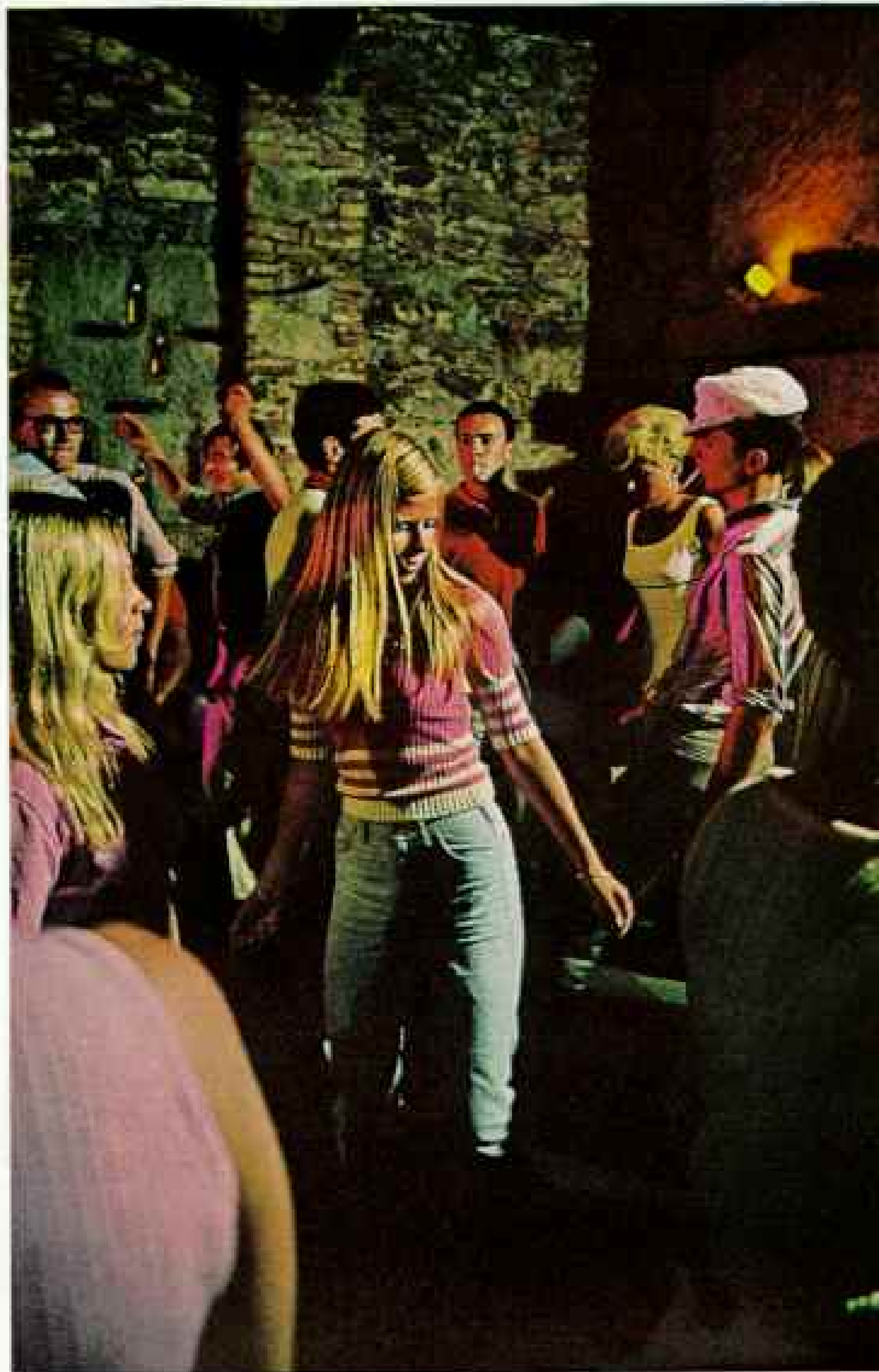


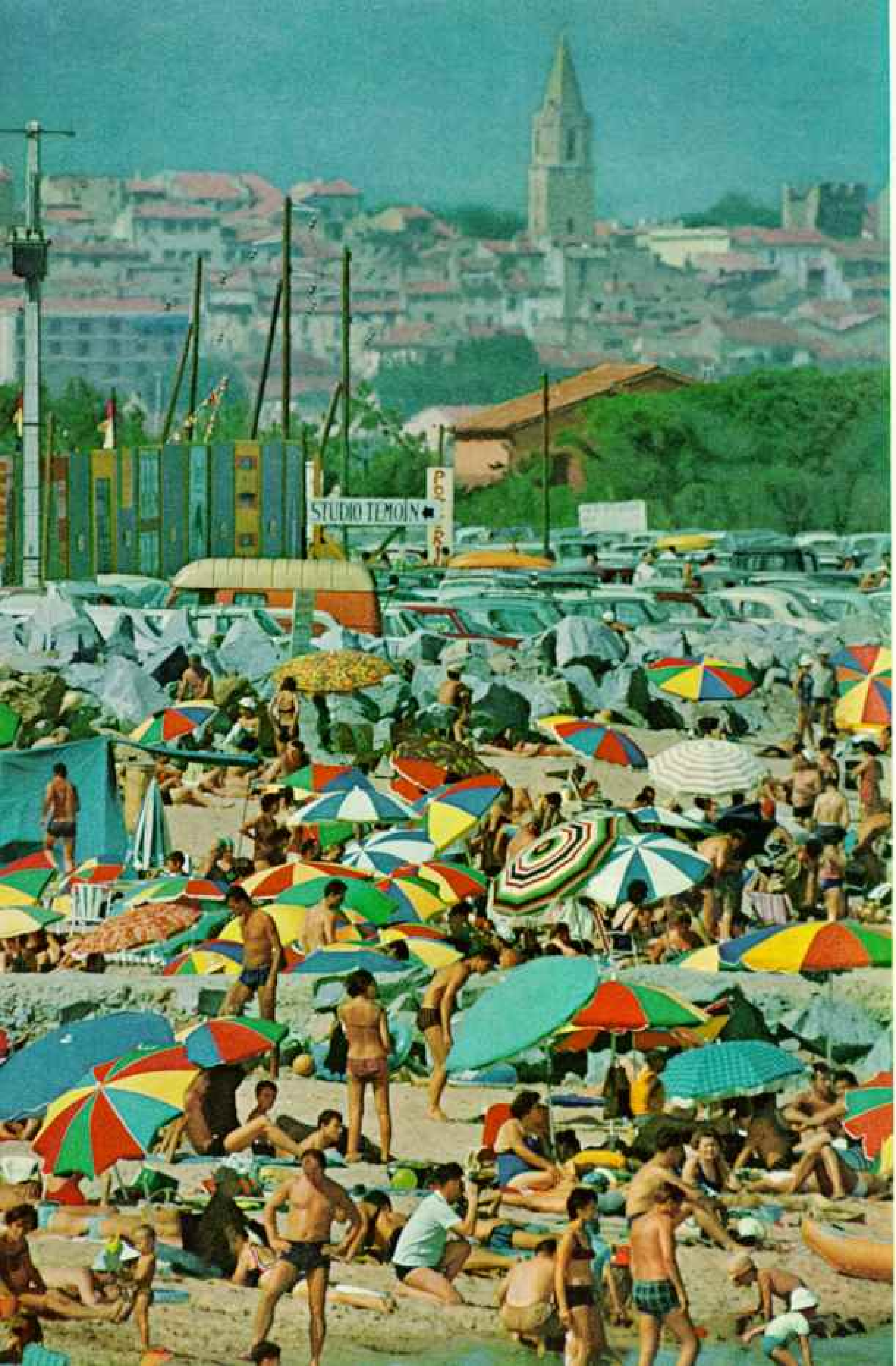
EXTACHROME (LARGE) AND EXTACHROME © N.S.E.

Soft-furred marmoset nuzzling her neck, an attractive bather at Tahiti Beach keeps the casual look favored by young sophisticates at St. Tropez.

Lacy bower shades patrons of an open-air beauty parlor in St. Tropez.

**Midnight.** Music throbs in the Esquinade Club, where the atmosphere is low key and offbeat. Young French film-makers, among ardent devotees of St. Tropez, revel in the town's flair for the unusual. Their "new wave" of the arts sparked a revolution in tastes in the so-called "now generation" of Britain and America.







inner harbor to shelter from the whistling gale. The Darse Vieille, where we lay, an ultramodern yachting center, was France's first American-type marina. Concrete finger piers provide convenient water, electricity, fuel, even telephone connections, and a central control office directs visitors to empty slips.

The Darse is also one of the oldest artificial harbors on the coast, completed in 1610 and paid for by a 25-percent duty on olive oil. To discourage smuggling and collect the tax, the city fathers of the 17th century had a chain stretched across the entrance every night.

To a sailor, Toulon is unusual in compressing all types of marine activity into a small area. From my deck, surrounded by yachts and fishing vessels, I could hear the piping of bos'ns' whistles on the warships and see sailors scurrying to obey, or by turning my head could watch stevedores discharging and loading cargo in the commercial port.

Despite its naval and martial associations, "Toulon lives by trade," I was told. The docks bore out the assertion, with mounds of red bauxite from the nearby countryside awaiting export, piles of powdered white clay imported from Canada to glaze paper, pulpwood from Sweden, and canned fish from Dakar.

### *Pied-à-Terre* Calls at Lonely Isles

After four days of wind, I looked through the hatch at dawn to find that the broom of the mistral had swept the sky clear. Dropping the lines, I made for the port of Hyères to keep a rendezvous with a French yachtsman, Jean-Paul Rivière, who had driven down from Paris to pilot *Pied-à-Terre* into little-known anchorages of the Îles d'Hyères.

"Here at the Peninsula of Giens, you are passing a milestone in your voyage," he told me as the bow swung toward the island of Porquerolles. "Since Marseille, you have been steering to the south of east, still inside the Golfe du Lion. Now, you will swing to the northeast, following the true Mediterranean coast in almost a straight line to the top of the Italian boot. You are leaving behind the

fiordlike calanques. Even the weather will change. Beyond Hyères the mistral visits only occasionally."

As Jean-Paul spoke, the Îles d'Hyères lifted, green-and-purple shadowed, reminding me of the islands of southern seas, although they lie at a latitude north of Nantucket. "Because the Maures and other mountain ranges block off the northerly winds, the rest of the Riviera is more tropical," Jean-Paul continued. "Flowers bloom all winter and palms line the waterfront of Menton as in some African city."

### Port Cros Offers a Teacup Harbor

We began our exploration of three of the small islands forming the Hyères archipelago with a swim in a lonely cove on the island of Porquerolles. Curiously, even when the nearby coast is awash with humanity, these islands remain aloof.

Then, crossing a six-mile channel between Porquerolles and Port Cros, *Pied-à-Terre* entered a tiny harbor. To port, a stone fortress stood guard over a village of a dozen houses. From the chimney of an inn in the center of a palm-girt rind of sand a thread of smoke lifted lazily, invitingly.

Port Cros was my dream of the Provençal teacup harbor come true—terra-cotta-colored houses topped by red tile roofs, and a green backdrop of trees climbing a steep hillside to merge with blue sky. I lingered on the quay as the sun set and a full moon shone down from the silvered heavens. A nightingale sent trills and arpeggios flowing across water that lay like a pool of mercury, the bird's notes as ethereal as the moonlight itself.

Next day, on crossing a narrow channel, *Pied-à-Terre* came on an island of quite different character.

"Look at the radar reflectors," said Jean-Paul Rivière as we skirted Île du Levant. "Much of the island is occupied by the French Navy for testing rockets."

Yet, despite Jean-Paul's continuing dissertation on the futuristic structures that bristled among ancient stone lookout towers,

**Beaming August sun signals vacation time** in Western Europe; factories shut doors, shops shutter windows, and holiday hordes descend on the Riviera. On the sands of Fréjus Plage, Swiss, Swedes, and Germans rub shoulders with Italians, Britons, and Parisians. Camera's long lens telescopes the mile between the strand and ancient Fréjus, whose population of 26,000 about matches its census in Roman times. Founded by Julius Caesar, Fréjus became a key naval base, but silt filled its harbor centuries ago.

I must confess my attention was elsewhere. For the remaining part of the island is occupied by the largest nudist colony in France.

Passing offshore, we could see hundreds of bare bodies basking like seals on rocks. A line of buoys warns cruising boatmen to keep well away from the village of Heliopolis, where many visitors arriving by excursion boat simply step out of their garments on reaching the quay.

A couple of years before, I had encountered another nudist colony on the mainland. I had anchored off the famed crescent of white sand near St. Tropez known as Tahiti Beach and swum ashore in my Port Cros "slip," a man's version of a bikini. Landing in a section of conservatively clad families, I immediately

felt horribly conspicuous. But soon, farther along on the beach, I found a different atmosphere. Families still picnicked on the sand while children splashed and tossed sticks for dogs in the shallows, but nobody was wearing clothes. Suddenly I seemed overdressed.

I had found a Through-the-Looking-Glass unreality in the Tahiti Beach area. The Polynesian motif extended to cafes bearing such names as Aloha and Bora Bora, bizarre with Pacific-island decor. Along the beach, no signs separated the clad from the unclad. As a final touch, fully dressed Arab peddlers trudged under the blazing sun from one group to the other, selling—of all things—shaggy goatskin rugs and blankets!

This time I found no nudists, but St. Tropez



gave me a shocking welcome nonetheless. As I jumped onto the quay, men in ancient uniforms raised bell-mouthed blunderbusses and shook the town with a crashing volley.

"What is happening?" I demanded, as the captain of the port helped me moor.

"Ah, monsieur," he shouted above the din of a second fusillade, "it is the *Bravade!* We honor the saint!"

He pointed to a gilded bust, wreathed with flowers and carried by musketeers. As I watched, the men rammed home another charge. On command, they raised their weapons. Thunder and lightning rent the sky. Anchored warships responded with broadsides. I had arrived for the 408th Act of Defiance, a celebration that originated in 1558.

MONOCHROME BY CHARLETON WITCHELL © K&L



From the man honored by this monumental din, the town took its name. Legend identifies him as a centurion in the court of Nero. For refusing to renounce his Christian faith in A.D. 68, Torpes (Tropez) was tossed to the lions; they merely licked his feet. Then he was decapitated and his remains set adrift in a small boat, together with a rooster and a dog, which presumably would devour the body. When the boat drifted ashore near here, the body was found to be untouched—a seeming miracle. Torpes later became the patron saint of the settlement.

After two days of uproar, the Bravade procession finally wound into the church to celebrate Mass and leave the bust of the saint in blessed quiet until next year. The town returned to normal—if St. Tropez can ever be called normal during the summer months.

#### Brigitte Brings Glamour to St. Tropez

One afternoon I was sitting in Pâtisserie Senèquier, where tables are so closely spaced that once I found myself sipping a stranger's drink while paying someone else's bill. Before me, strollers jamming the quayside street forced automobiles to move at the same pace, like lumps of sugar carried along by ants.

I struck up an acquaintance with a gentleman at a neighboring table, and he gave me some of the modern history of the town.

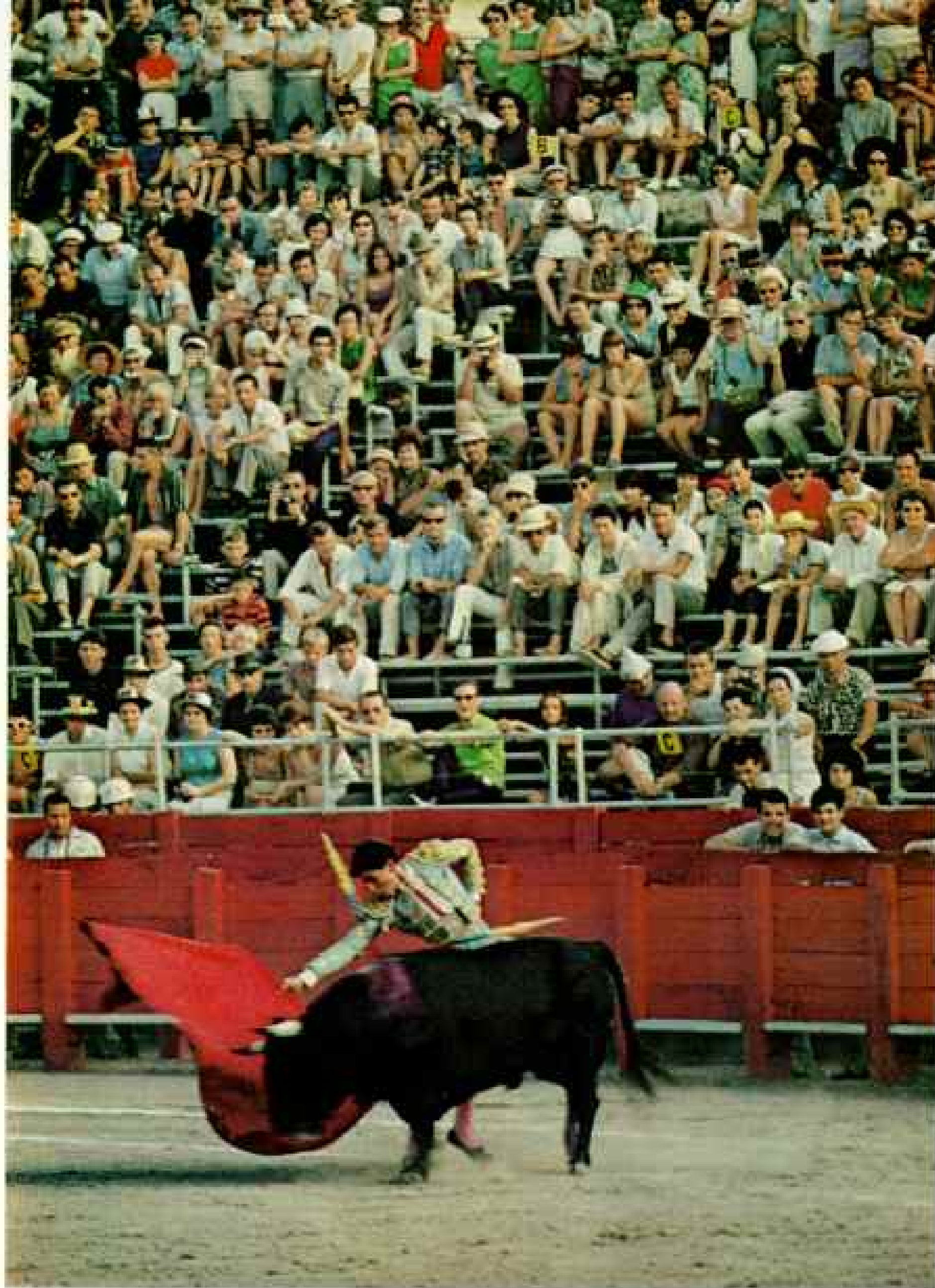
"Not many years ago this was a sleepy fishing village," he said. "The novelist Colette and a few serious artists came to work in solitude. But then Brigitte Bardot made her first film here, and almost overnight St. Tropez became the glamour capital of the Riviera. Every girl copied Brigitte's hair and clothes. Slacks were cut lower and sweaters tighter, until certain daring styles became 'the St. Tropez look.' Here is escape, a fulfillment of youth" (pages 806-9).

Yet even in gay St. Tropez, the solid virtues of the simple townsmen and the fishermen

Black-browed skies above St. Raphaël herald a mistral, the violent northerly wind of the western Mediterranean. The author made this dramatic photograph as a last shaft of sunlight dimmed before the coming fury. "For 36 hours the heavy sea surged *Pied-à-Terre* against her lines," he reported, "and at storm's end quayside sand coated the deck and cockpit."

Wealthy Roman families of Fréjus journeyed to St. Raphaël in summer "to take the airs." Napoleon landed here on his return from Egypt in 1799, and 15 years later sailed from this same port for his brief exile on Elba.





survive. The fishing fleet occupies a quarter of the yacht-packed harbor, and its rowboats of antique pattern are unchanged except for the small engines which putt-putt away from the quay at dawn, while many of the visitors are still dancing.

I met Jouan, 74, who had come back with a catch of 120 tiny silver fish.

"My two sons are fishermen, also," he told me, "but in the summer they work as sailors on the yachts. Fish now are scarce: A man today must have the passion to fish, not just fish to gain money."

The men of the sea have a basic stability that resists change. While they remain, so will the soul of the coast and the spirit of this part of France.

For all its charms, St. Tropez is not good shelter during a mistral. When a morning forecast promised bad weather, *Pied-à-Terre* scurried for nearby St. Raphaël under darkening skies. Snug behind the breakwater, I watched from the cockpit as a weird flow of sunlight lit the waterfront buildings, while storm clouds gathered (preceding pages). With the dark came the wind, a solid weight pinning down everything in the harbor.

#### Caesar Made Fréjus Famous

Not far inland stand the ruins of the great Roman naval base of Fréjus, founded by Julius Caesar in 49 B.C. as Forum Julii. At first the settlement Caesar named for himself was only a trading post on the Aurelian

With a swirl of his cape, a Spanish matador masters a bull in the arena at Fréjus. He dedicated his daring to the famed Pablo Picasso, presenting an ear of his adversary to the artist, who sits in a cape-draped box (below). A long-time resident of the Riviera, Picasso inspired a new school of potter-painters in the little town of Vallauris. The Grimaldi Museum at Antibes displays many of his oils and ceramics. Over the years the Riviera's sparkling sunlight and bold colors have attracted a stream of artists: Corot, Degas, Boudin, Cézanne, Renoir, Bonnard, and Matisse.

REDACTED (INCLUDING PAGE 314-17) BY THOMAS HERRIA © N.C.S.



Way, the road linking Rome and her Gallic province. But when the people of Massilia—the Greek Massalia—supported Pompey during his bitter rivalry with Caesar, and Pompey was defeated, Caesar stripped away Massilia's wealth and gave much of it to Forum Julii.

Engineers dug a canal to the sea, 30 yards wide and 500 yards long, and from a marshy area created a 54-acre basin. More than a mile of quays transformed Fréjus into a leading port of the western Mediterranean.

Octavius, later the Emperor Augustus, used it as a base to train fast, maneuverable galleys for his Egyptian campaign, in which he defeated the ponderous ships of Antony and Cleopatra at the Battle of Actium. Later, he rewarded his veterans with land grants in and

Nature lavished her palette on the wave-lashed Estérel range: rust-red rocks, turquoise coves, spring-green pines, and cork oaks. Worn down by millions of years of erosion, the craggy heights of porphyry rise only 2,000 feet. Here 18th-century bandit gangs found haven while terrorizing the countryside. Today the tilted terrain provides a landmark for sailors skirting the coast between St. Raphaël and Cannes and a vista of tranquil beauty for motorists on the Corniche d'Or.









around Fréjus, turning it into one of the most typical Roman cities outside Italy.

Since those days the sea has receded more than half a mile, and I found it difficult to visualize Fréjus in the days of its maritime glory. Cows graze on a grassy meadow which once was the harbor. Yet 25,000 people lived here, supplied with fresh water brought by an aqueduct 25 miles long. Citizens enjoyed marble baths complete with steam rooms and massage attendants. They were entertained in the first amphitheater erected in Gaul, and rode in chariots to the beach, where a holiday suburb took form.

Now Fréjus's suburb has grown into a resort community unique on the Riviera. In St. Raphaël I found myself among elderly couples looking in shopwindows or gazing serenely out over the water.

"My wife and I rent an apartment for two

or three months a year," a *vieux monsieur* told me. I sat by him on a bench, and despite the sun he wore a dark suit, high-lace shoes, and a felt hat, as though he had just left an office. "Many are like us, from all of northern France—lawyers, doctors, merchants. Not rich, not poor. We don't want the crowds or the night clubs of other towns along the coast. St. Raphaël is a quiet backwater."

#### Staid Resort Envy the Bikini Set

But even this Gallic version of Florida's St. Petersburg is changing in the Riviera boom. A red-cement promenade lined by restaurants, bars, and what-not shops has been built along a beach of imported sand. St. Raphaël, no longer content to be an ample matron, now wishes to slenderize and, like St. Tropez, parade as a glamour girl in a bikini.

As I followed the shore eastward out of St.



Bare feet stroll the seaside promenade in Cannes, and, as usual, there is a nonconformist—one who prefers shoes. Care-free girls on vacation concentrate on sunlit fun, picture-making, and, who knows, the romance that may be just around the corner—or close behind.

Beneath the tinsel and gaiety of Cannes, workaday chores never cease. A fisherman's wife sits on the beach and mends nets, as women have for centuries in this part of the world.

Raphaël; the coast of the Estérel range opened before me. Blue seas broke white over sunken offshore ledges and creamed against terra-cotta-red rock walls; pines grew in crevices like emerald spires (pages 816-17).

Then suddenly, as though chopped off by a giant's knife, the mountains were astern, and I was skirting a coastal plain. From the sea, the shoreline seems one long, narrow waterfront city stretching from La Napoule to Nice, by day a sprawling complex of villas and hotels, by night an almost unbroken necklace of lights.

Cannes was my first stop. "You are lucky to find a place to moor," said my neighbor in a small cruiser to starboard. "Chap there just pulled out a few minutes ago. I waited two months to make the inner sanctum."

Cannes exudes opulence. It is the yachting capital of the Riviera, and nowhere else do the yachts gleam so sleekly. Smart hotels and expensive boutiques look across the Boulevard de la Croisette to sands occupied by private colonies and public beach (next two pages).

Waiting to cross the wide street to the seaside promenade, I felt I was stemming a tide of automobiles only

REDUCED FROM THE THOMAS HEERNA (LEFT) AND HATES LITTLEPAGE © N.C.C.





slightly less in length than some of the yachts. By night the casino glitters with diamonds and sables, by day the terrace of the Hôtel Carlton sparkles with silver service and champagne in fluted crystal.

Cannes received its start as a resort by accident. In 1834 a British jurist, Lord Brougham, was on his way to Nice for a holiday when an epidemic of cholera halted him. Turning back, he stopped at the little port whose name traditionally derives from the canes growing in the nearby marshes. His Lordship liked it so well that he built a house and returned for the next 34 years. His friends followed, and before his death the poor fishing village had been transformed into a winter showcase of the fashionable world.

820

Glittering garland limns the crescent of Cannes as street lamps supplant day's waning light. The hotel-flanked Boulevard de la Croisette sweeps past the old harbor, the pink-washed Municipal Casino, and the beaches of fine sand. Yachting party anchored in the Golfe de la Napoule finds the city a show in itself. Lord Brougham on a visit from Britain discovered its charms more than a century ago, and by 1890 as many as 60 members of royalty wintered there.





ANIMACHROMED BY THOMAS WEBER © NATIONAL GEOGRAPHIC SOCIETY





While Cannes basks in an aura of wealth, neighboring Juan les Pins bubbles with gaiety. In its glare of neons and blare of music, it is a resort for the young. Within a few minutes I noted license plates from a dozen European countries, mostly small cars filled with students on vacation calling to each other in many languages.

#### Cycling Violinist Harries Traffic

At the town's main intersection I chose a sidewalk table in front of the Café Pam-Pam. It was late, but small shops were still open, selling everything from bikinis to stuffed alligators made into lamps. Suddenly a bicyclist disrupted traffic. Playing a violin without missing a note, he rode among the cars, shaving bumpers and fenders with paper-thin precision, now sitting on the handlebars pedaling backward, now standing on the saddle. At

each near-collision he beeped a tiny horn at the startled motorist, doffed his cap, and rode away, still playing his violin.

"We speak of him only as *le cycliste*," said the waiter in answer to my question. "Nobody knows his name. In the tourist season he drives up in a little car, unloads his bicycle and violin, gives a show, passes his hat, and goes off to some other place like a seagull."

Less than five miles from the holiday bustle of Juan les Pins I found utter solitude. One afternoon *Pied-à-Terre* crept through a narrow entrance into the tiny port of St. Honorat, one of the islands off Cannes. Half a dozen small cruising boats would have filled the harbor. Trees reflected in the water, and as I put lines ashore, bells pealed.

In A.D. 410 a pious man named Honorat, seeking to escape the world, settled here on the outer of the two main Îles de Lérins.





PHOTOGRAPHS BY CARLETON MITCHELL (OPPOSITE) AND THOMAS HEERIS © N.Y.C.

To this day his retreat remains detached: no hotels, no roads, no automobiles—only thirty monks cloistered behind monastery walls, and perhaps a dozen other inhabitants, including the operators of a small restaurant serving lunches to visitors.

For three days I walked paths once trod by barefoot pilgrims who, during the Middle Ages, received the same indulgences for a trip to St. Honorat as to the Holy Land. Bells that awakened me in the mornings summoned the monks to prayer and to fields and vineyards. In the afternoons I swam in clear water or browsed in cloisters that sheltered as many as 4,000 monks in the seventh century.

Across a channel from St. Honorat I could see the silhouette of Île Ste. Marguerite, named for St. Honorat's sister, who followed to be near him. But he had taken vows renouncing the outer world and would promise only to

**Apéritifs by candlelight** whet appetites at Chez Félix, a waterfront bistro in the old walled section of Antibes. The Greeks, who founded the port, called it Antipolis, and used it as an advance post against attacks by the Ligurians. In medieval days Antibes served as a bastion for the Kings of France when the Dukes of Savoy fortified neighboring Nice. At terrace tables facing an ancient gate near the harbor, diners savor *loup de mer au fenouil*—sea perch with fennel—or *supion à la niçoise*—baby octopus in a sauce of tomatoes and garlic.

**Pedaling backward** while fiddling and smoking a cigar, a trick cyclist entertains luncheon guests at Chez Félix. Fruit, flowers, and vegetables adorn the hat of the rider, who spurns tempting offers to perform on stage.



visit her each year during the blossoming of the almond trees. Marguerite prayed and, we are told, a miracle occurred: Every month the same tree on the shore blossomed anew. Obedient to divine intervention, Honorat fulfilled his vow to the letter.

On Ste. Marguerite a village clusters round an anchorage at the base of an abrupt hill topped by a grim fortress. Here my path again crossed that of the Man in the Iron Mask, whose prisons included the Château d'If outside Marseille. In hot sun I trudged up a steep path to the bastion where he had been confined.

Cell No. 5 bore the legend, "*Prison du*



SYNCHRONIZED BY WALTER BEAUFRE COBARRIS (FRONT) AND GATE LITIGANER © R & D

Brushful of pollen fertilizes a "Christian Dior" rose at Cap d'Antibes. Mme. Francis Meilland continues the work of her late husband, who developed this beauty as well as the famed "Peace" rose.

Hanging gardens of flowers surround big, bustling Nice; cut blooms go to markets throughout Europe. The city's celebrated winter Carnival reaches its climax with a Battle of Flowers, when revelers hurl blossoms in a free-for-all on the Promenade des Anglais looping the Bay of Angels. Blue haze all but obscures southern flanks of the Alps.

*Masque de Fer.*" Opening a nail-studded door, I found a wall of stone several feet thick, from which a second iron door opened into a bare cell with a small barred window.

I asked the custodian, "Can you tell me who the mysterious prisoner might have been?"

He gave a Gallic shrug of the shoulders that extended to the fingertips. "Monsieur, a member of the Académie Française once observed that there are not less than 22 theories. Some say he was a twin brother of Louis XIV, hidden to prevent a clash over the throne. Others believe he was an Italian named Mattioli, arrested on foreign soil and imprisoned illegally, and so hidden to prevent an international quarrel.

"Legend even makes him the great-grandfather of Napoleon: It is whispered he sired a baby who was taken to Corsica and given to foster parents of good standing—'*di buona parte*' in Italian—so the child later adopted the name Buonaparte, which passed on to his grandson, Napoleon. Only this is certain: Such a man existed and he was never without a mask, but the mask was of velvet, not iron."

#### Future Emperor Plagued by Debt

After my sojourn in the islands, I moved on to Antibes harbor, which faces northeast, looking across the Bay of Angels to Nice. One theory derives Antibes' name from Antipolis, meaning "the town opposite" in Greek.

I dined that night at Chez Félix, a waterfront bistro, and from a sidewalk table looked out at boats moored in the harbor, framed in an arch that pierced the old town wall (pages 822-3). Couples strolled along the ramparts where once crossbowmen had patrolled.

The military atmosphere reminded me that Napoleon had lived in Antibes with his mother and sisters. A general in charge of the defense of this section of the coast, the future emperor did not always receive his pay in time to meet his debts. Local gossip maintains that the queen-mother-to-be did the household laundry, while the budding princesses were sometimes reduced to furtive raids on neighbors' fig trees and artichoke plants.

In Nice across the bay, I felt a bustle I had not experienced since Marseille. Pleasure craft occupied only a small portion of the harbor, but steamers lined busy quays opposite, from which cranes swung cargo into holds.

Nice is not one city, but two: the carefree resort where visitors enjoy strolls along the famous Promenade des Anglais that rims the seafront, and a thriving industrial complex. Its population of almost 300,000 makes it the





Eagle's eyrie of Èze, a fortress town, caps a 1,300-foot pinnacle above Cap Ferrat (right). A drive along the winding Grande Corniche offers this view of a ruined medieval castle surmounting dark, narrow alleys and low buildings with three-foot-

fifth largest city of France, and its airport is second only to Paris in international traffic. It produces spaghetti, cement, radio parts, motion pictures, women's clothes, medicine—and, most delightfully, flowers.

The surrounding countryside resembles a vast garden, acres of glassed-in greenhouses alternating with fields of flowers that pattern the lower slopes of the Maritime Alps (page 824). Millions of blossoms annually funnel through the covered wholesale market extending along the Cours Saleya.

I arrived at the market in the early morning to find myself swimming in a sea of perfumed color. Buyers and sellers hovered over the blossoms. I watched one energetic young man

dart like a hungry bee from lanes of roses to banked masses of carnations and anemones. He would speak rapidly to each vendor, then either shake his head and move on or jot notes in a small book as he strode away. I could not understand one word of his conversations, so fell into step and quizzed him.

#### Flower Merchants Talk in Shorthand

"The language we speak?" he asked, puzzled. "French, of course." Then he laughed and added, "But it is a kind of verbal shorthand, our own code. There is no time to waste in formal speech. The flowers are perishable and must be on trains without delay."

He handed me his business card, which



BARBICHOVONE BY BATES LITTLEHALLS © N.E.S.

thick walls. No vehicles may enter the gates; visitors climb on foot to the castle and its tropical garden. Believed to derive its name from the Egyptian goddess Isis, *Eze* has had many masters, including Phoenicians, Ligurians, Romans, and Moors.

announced that his firm was Passeron Frères, expeditors of natural flowers. "Most of our shipments go to wholesalers in Paris," he explained, "but we send flowers from the Riviera to brighten homes in other cities in France and all over Europe."

A short walk and I was on the Promenade des Anglais, a street four miles long that is part park and part highway. Despite the careful landscaping of the promenade, I could not help noticing that the many beaches along it consisted not of sand but of three sizes of rock: boulders, stones, and pebbles. Fitting their torsos to the contours, sun bathers huddled on towels, while waves breaking on the shore clattered rocks together like casta-

nets. As an experiment, the town fathers are importing sand for some sections, hoping that winter gales will not sweep it away.

Dropping *Pied-à-Terre's* lines, I made a way through the bustle of Nice's harbor, bound for Villefranche. *Pied-à-Terre* cleared the point formed by Mont Boron, and there, rising majestically beyond Cap Ferrat, towered the Maritime Alps, mighty buttresses lifting directly from the Mediterranean to join the rooftop of Europe.

It was a clear day, a perfect day, the sky smiling overhead, the sea smooth, a haze over the peaks and valleys, everything blue. In sheer exuberance I delayed my planned stop at Villefranche and cruised along the coast.

Soon I saw high on a cliff the towers of Èze, perched like an eagle's nest (preceding pages). They reminded me that this section of the Riviera had long been a battleground in the guerrilla warfare between Africa and Europe. Hit-and-run maritime raids by Moslem pirates had finally forced men from the shore to more easily defended villages high above.

The miles sped astern, and suddenly I came under the fortress-castle of the Principality of Monaco, ancient seat of the Grimaldis. Though the Grimaldi dynasty is popularly identified with Monaco through Prince Rainier and his glamorous Princess Grace, its name is also associated with other parts of the Riviera, including the castle that defends Antibes and the village of Roquebrune.

Some say the Grimaldi line descended from a nephew of Charles Martel, who defeated the Arab invaders of France at Tours in 732; others claim the family had its beginnings in Genoa. In any case, a Grimaldi wrested the domain of Monaco from the Genoese in 1297, and as I came abeam I found myself recalling lines attributed to a French poet:

*Crouching over the sea,  
like a weary monster,  
The Grimaldi's ancient rock  
dreams of the past.*

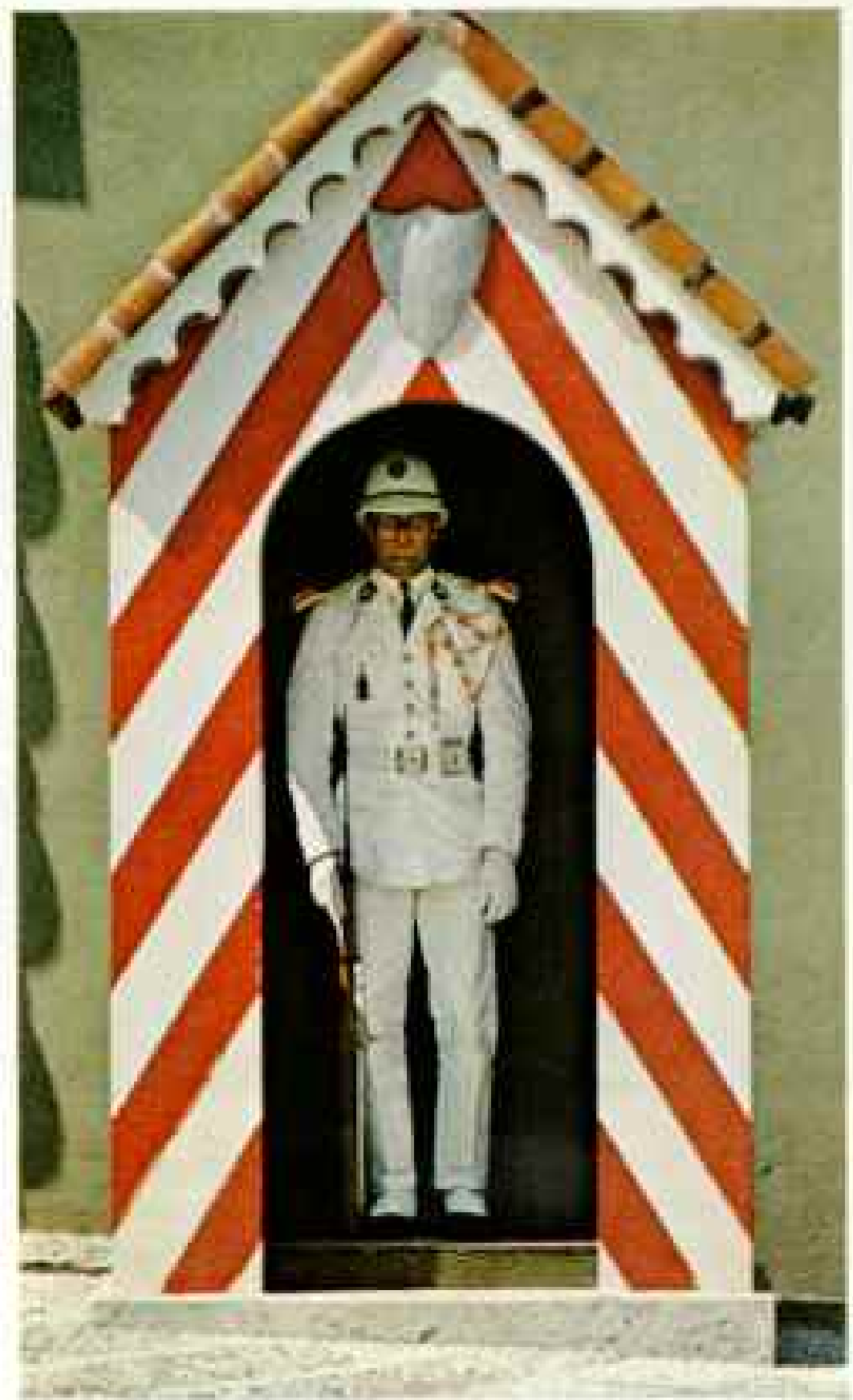
If so, it is almost the only thing in the principality not living in the present and looking toward the future. Passing the Oceanographic Museum, a leader in discovering new worlds below the surface (pages 830-31), *Pied-à-Terre* joined the marine parade into the busy harbor of Monte Carlo. Buildings in all stages of construction played leapfrog up the hillside, and dredges were creating new plots of land from the sea by pumping ocean bottom into retaining walls.

As I tied up in front of an Italian boatyard to fill my tanks with French gasoline produced in the Sahara, the international and independent flavor of this tiny segment of the Riviera struck me forcibly. Through the centuries the Monegasques have refused to be crushed or absorbed by the mighty forces on both sides. Neither French nor Italian, Monte Carlo adds a dash of *sauce piquante* to the whole coast.\*

Doubling back around Cap Ferrat, I moored in Villefranche harbor to plunge again into the past. A few steps behind the waterfront I found a street named Rue Obscure, the Dark Street, and there I stepped out

of brilliant sunshine into the gloom of a tunnel, artificially lighted even at noon. Heavy beams supported houses that had bridged the street in medieval times, for Rue Obscure dates from the 14th century (pages 832-3).

Rue Obscure comes out into the light where it joins Rue du Poilu. Nearby is a tiny open space, cobbled, with a lion's-head fountain spilling into a basin. On the fountain's edge sat an old man in a sailor's knit jersey and visored cap. We talked, and I found he was indeed a matelot, having been a fisherman, a sailor on the cruiser *Edgar Quinet* in "the war of 1914," and later port captain of Villefranche.



REPRODUCED BY THOMAS HERRIN © N.Y.S.

In a candy-striped guardhouse, one member of Monaco's 80-man palace guard stands watch outside the royal residence. Since 1297 the Grimaldi family has ruled this vest-pocket principality, only half the size of New York's Central Park. Cobble streets and venerable houses in the clifftop town of Monaco contrast with the traffic jams and luxury towers of the newer Monte Carlo. Roulette wheels spin day and night in the floodlit casino (opposite).

\*See "Miniature Monaco," by Gilbert M. and Donna Kerkan Grosvenor, *GEOGRAPHIC*, April, 1963.





"Where do you live?" I asked, and he pointed to a house with its upper stories overhanging Rue Obscure.

We entered a narrow door opening on Rue du Poilu to climb steep stone steps guarded by a wrought-iron rail. Naked light bulbs hung from the beams of each floor. Five floors we climbed, and then my host, Basile Massa, opened a door to a back apartment and called to his wife.

Madame Massa came out of a kitchen alcove, drying her hands on an apron and apologizing for the disorder of the apartment, which was shipboard-neat. On a whitewashed wall a large picture of the cruiser *Edgar Quinet* featured six tall funnels belching black smoke. Next to it hung three medals in a frame, and a certificate conferring on Basile Massa the decoration of "Chevalier, Ordre du Mérite Maritime."

Through the door to the bedroom I could see on the wall a portrait of Monsieur Massa as a young man, erect in a uniform of bygone cut, mustaches bristling fiercely. Ready on a table by the window reposed field glasses, worn to bright brass. From a small balcony we looked down into the open section of Rue Obscure, and beyond lower rooftops lay Villefranche Bay.

"I have lived in this house all my life," Monsieur Massa said, "and my father before me." Turning, he pointed to a certificate that conferred on Joseph Massa, "sailor of the first class," a commemorative medal for his services in the campaign of 1870-71. "I am 79 years old, my wife is 84. She came from Italy when she was a girl."

Madame Massa drew chairs to a table in the central room, and we sat to sip generous glasses of Provence Coquillages. As we drank and talked, I thought of the people who had done the same in this same room for generations beyond imagining.

#### History Repeats Itself With a Splash

Villefranche pleased me so much that I lingered, moving into a room in the Hôtel Welcome. My balcony overlooked the old port and the bay beyond, in which ships of the U. S. Sixth Fleet had based in postwar years. Off the embracing arm of Cap Ferrat, I viewed the waters where Capt. Jacques-Yves Cousteau and Edwin A. Link had led historic underseas research projects.\*

But re-enactment of a far older event entertained me one afternoon as I sat on my balcony.

In 1538 Charles I of Spain, aboard his flagship at Villefranche, received a state visit from his sister, the wife of Francis I of France. Charles descended the gangplank to escort her on board, and then started back, followed

\*In the *GEOGRAPHIC*, see "Working for Weeks on the Sea Floor," by Captain Cousteau, April, 1966, and "Our Man-in-Sea Project," by Mr. Link, May, 1963.



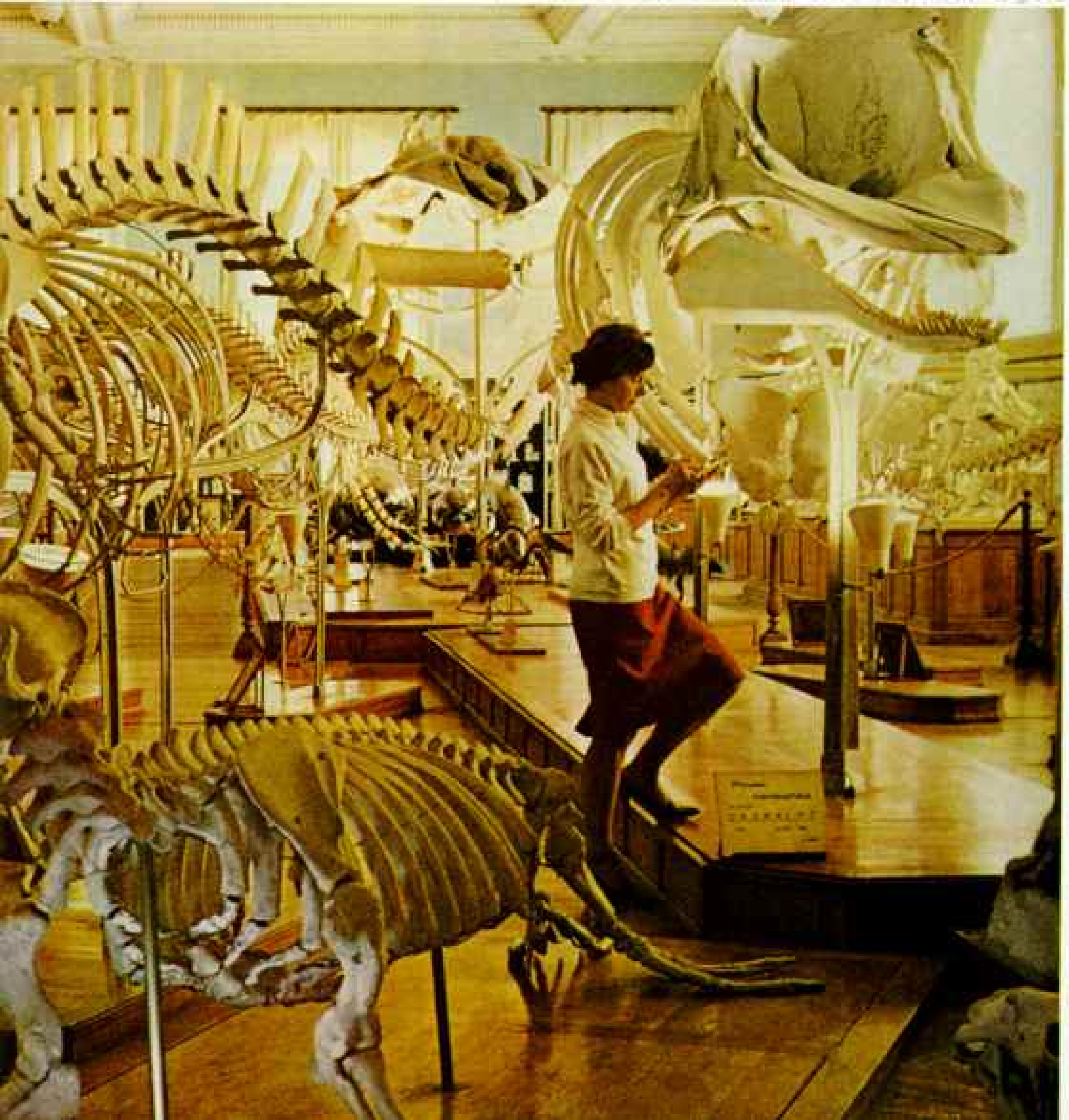
Dean of undersea explorers, Capt. Jacques-Yves Cousteau directs the Oceanographic Museum in Monaco. For two decades Cousteau has probed the waters of the world as leader of *Calypto* expeditions, often sponsored by the National Geographic Society, and he established a base on the Mediterranean floor where oceanauts lived and worked for weeks.

Last year Captain Cousteau welcomed almost 600,000 visitors to the museum. Many scientists utilize its marine research laboratories. Albert I, great-grandfather of Monaco's Prince Rainier, founded the institution as a showcase for the remarkable collection of marine specimens he had acquired on 29 scientific voyages. Skeletons of seagoing animals, including a beaked whale, left, elephant seal, foreground, and long-jawed sperm whale, right, fill an entire hall.



Like a feather bed, a sea anemone cushions a clownfish. They dwell with thousands of brilliantly variegated tropical fish in one of 60 tanks in the museum's aquarium.

EXTRACTION (OPPOSITE) BY LUIS BARRON, EXTRACTION (ILLUSTRATION) AND ASSEMBLY BY YVES COUSTEAU © N.G.S.







Even cats walk warily on the steep, winding streets of Villefranche. Up precipitous green hills the city climbs, houses built high to make the most of every foot of space. For here the foothills of the Alps dip a toe into the Mediterranean and cup a bay deep enough to berth a fleet of warships.

In the waterfront section of Villefranche, one thoroughfare, aptly named Rue Obscure, or Dark Street (below), survives virtually unchanged since the 14th century. Houses join overhead to form a tunnel; wooden beams, some still round and rough as they came from the forest, support walls and ceilings. Nail-studded doors and barred windows recall medieval times, when no man felt safe beyond his own threshold.



by a suite of lords and ladies resplendent in brocades and plumes. Suddenly the gang-plank gave a loud crack, and the glittering entourage plummeted into the water. Picturing the scene, I looked down just as a French yachtsman, jaunty in blazer and braided cap, missed his footing between dinghy and quay and fell into the harbor with a resounding splash. I wondered whether the royal profanity of Charles could have been more volcanic.

#### Artists Saved Èze From Ghostly Role

Even as I explored Villefranche and adjacent Cap Ferrat, my thoughts returned to the walled town of Èze, most famous of the "perched villages."

"Èze and La Turbie and the *corniches!*" exclaimed Monsieur Van Ruys, then director of the Naval Yard of Beaulieu. "Ah! They are intertwined with the story of the coast. Leave your boat and visit them by automobile."

The roads called *corniches*, linking Nice and Menton, lie on three levels. The lowest, following the shore, is the *Corniche du Littoral*; the middle, running past Èze, is the

*Moyenne Corniche*; and the third, built by Napoleon a century and a half ago, partially on the foundations of the ancient Roman Aurelian Way, is the *Grande Corniche*.

The *Moyenne Corniche*, leaving Nice, begins to climb almost immediately, coming out above Villefranche to make anchored ships look like wind-up toys. Èze carries out the metaphor—a gingerbread town, a Hansel and Gretel fantasy in stone. Its inhabitants had lived in this inaccessible eyrie until the young U. S. Navy led in clearing the Mediterranean of the Barbary pirates in the early 1800's. Then the people deserted their inconvenient perched villages and returned to the tillable fields and easier life below. Èze and its sister villages remained virtual ghost towns until taken over by artists' colonies a few years ago.

I entered Èze through a gate commanded by arrow slits in thick stone walls. Cobble alleyways took me to a 14th-century chapel with pebble mosaics at the entrance. Sun made the worn stones glow with a soft patina.

A tiny cafe with tables under a trellis of grape leaves overlooked the cloud-dappled

ILLUSTRATION BY THOMAS HERRIN © N.E.E.



sea far below. Ancient roofs sprouting television antennas, craftsmen fashioning silver souvenirs where bygone smiths had beaten out pikes, a bistro that sold American soft drinks—even in Èze I found the blending of old and new that is the most beguiling characteristic of the Riviera.

#### Trophy Stands for Roman Victory

Later that afternoon, in La Turbie, I walked between tall, narrow-fronted houses of a medieval village built along streets of geometric precision. La Turbie grew up where the Roman highway from Italy to Gaul crossed roads built during Augustus's campaign to

subdue 46 unconquered tribes living in the Alps. Victory in that campaign gave the Imperial City final control of southern Europe. In 6 B.C. the Roman senate voted to commemorate the victory, and as I made a final turn I came on the Trophy of the Alps, one of the last surviving victory trophies of Rome.

My first sensation was awe. On a remote mountaintop, Roman engineers had constructed an edifice 164 feet high and 125 feet wide. A Doric colonnade rises on a square base, bearing an inscription to Augustus, including a list of conquered peoples. Once statues of the campaign leaders stood in the niches, and a gigantic statue of Augustus





flanked by two captives topped the whole.

The long-vanished builders chose a magnificent site. Below, a panorama extends from the coast of Italy to the distant loom of the Estérel range. Gradually the sun sank below the horizon, and as it did a full moon shone over the Mediterranean. In that magic light the trophy lost the scars of the years, like a face regaining the full beauty of youth.

Again aboard *Pied-à-Terre* skirting the coast off Monaco, I rounded Cap Martin to find the tropics: Palms grew around Menton harbor, and bougainvillea, bananas, and citrus trees cling to the amphitheater of hills.

"It is well known that Menton lemons are

the finest, monsieur," the garçon of a waterfront bistro told me, "and there is a reason. When Eve was driven out of Eden, she plucked a lemon and carried it secretly. For a long time she and Adam wandered in misery, looking for something like the paradise they had left. Finally they arrived at a place with the blue sea on one side and green hills on the other, while the flowers were a carpet under their feet. The outcasts felt they had come home.

"'Here we will stay,' said Eve to Adam, 'and I shall plant my golden fruit.' Clearly, monsieur, it was Menton they found, and the lemons have done well ever since."

The origins of Menton are indeed lost in the mists of time. Here almost a century ago an archeologist discovered a skeleton of the Paleolithic era that he called Menton man, the first of 16 found in the area.


During Roman days the town of Lumone existed on Cap Martin, and some historians believe Menton grew up as a wealthy suburb. Others believe it began as a pirate lair in 714. In any case, it was long a Saracen stronghold. Retaken by the Counts of Ventimiglia in the tenth century, it passed to the Genoese and later to the Grimaldis. In 1860 Menton citizens voted unanimously for annexation to France.

#### Menton Speaks a Jumbled Jargon

As I walked the streets of the *Vieille Ville*, I listened to a dialect that memorializes the successive waves of inhabitants, a jargon combining French, Italian, Provençal, Spanish, and Arabic. English should almost be added. Menton became a favorite place to escape London's chill in the last century, when physicians were quick to prescribe the Riviera for almost any condition of health. Queen Victoria came, along with the great of her day, who lived in rambling hotels and villas that still line the seashore and run up into the hills.

In this, my last French port, I sat at an outdoor restaurant table in shirtsleeves, eating food more Italian than French, while within sight stood a statue of an English queen. My table was drenched in sunshine, but above soared the Alps' snow-capped peaks. The *Vieille Ville* behind the harbor retained its medieval character; along the waterfront, jukeboxes played. The Azure Coast, vividly varied in people and geography, mellowed by the past and galvanized by the present, stays in character to the end.

THE END



Love affair with the sea inspires a heels-over-head salute as two sun-seekers while away a day at Menton.

At this last French port of call before the Italian border, as at most Riviera beaches, stones rather than sand carpet the shore. By night the visitor falls asleep to the ceaseless rumble of rocks tumbling in the waves.

A delectable land, seemingly designed for pleasure, the Riviera has, paradoxically, experienced more of the horrors of war than any other part of France. For nearly 2,000 years a succession of conquerors pillaged its towns.

Arts and culture flourished here from the beginning, but not until the 19th century did the climate gain international fame. Wealthy Englishmen escaping from fog and Russian noblemen fleeing blizzards were the first to arrive. For generations the Riviera remained the exclusive winter haunt of royalty and high society. Today it welcomes all classes in all seasons.



Atop the roof of Antarctica, Peter Schoening and John Evans on December 18, 1966, unfurl flags of the United States and National Geographic Society on Vinson Massif's 16,860-foot summit. The Society, the National Science Foundation, and the American Alpine Club—with the invaluable support of the U. S. Navy—made possible the ten-man expedition that climbed for the first time Antarctica's loftiest mountains. Flags of the 11 other Antarctic Treaty nations ring the crest. From left: New Zealand, Australia, Japan, Norway, Belgium, U.S.S.R., France, Argentina, Chile, South Africa, United Kingdom.

# First Conquest of Antarctica's Highest Peaks

By NICHOLAS B. CLINCH

*Photographs by members of the American Antarctic Mountaineering Expedition*

THE ANTARCTIC COLD stabbed viciously at our bodies, and what we saw dropped our ebbing confidence still lower.

Mount Tyree loomed above us, a hulking summit that would demand respect from the most tested alpinist. Wind-blown snow that fogged its harsh face did little to mask the malice in jagged ridge spines and plunging cliffs.

Beside me at 14,000 feet on the icy shoulder of Mount Gardner stood fellow mountaineers with long experience in the Himalayas, Europe, and our own Northwest and Alaska. Tyree, Antarctica's second highest peak, held us awestruck.

We had already conquered Antarctica's highest mountain, nearby Vinson Massif. At 16,860 feet, Vinson overtopped Tyree by 570 feet. But compared to this, Vinson had been a Sunday stroll.

The temperature was dropping. Twenty below. Twenty-five below. The sun in its endless circle around the sky had slipped behind the broad summit of Mount Gardner. Now eight of us waited

OPPOSITE PAGE  
FOLDS OUT

Invading a no man's land above the clouds, expedition leader Nicholas Clinch struggles to the crown of Vinson. Behind him the pyramidal tip of Mount Tyree appears to float in the sky. The author and his teammates became the first recipients of the Society's new John Oliver La Gorce Medal (page 864).

By profession a lawyer practicing in Los Angeles, Mr. Clinch at 36 stands in the forefront of American mountaineers. Prior to his Antarctic venture, he had led two U. S. expeditions to Kashmir for the first ascents of Masherbrum and Hidden Peak (Gasherbrum I). The latter at the time was the highest mountain ever climbed by Americans.







PHOTOGRAPH BY SAMUEL C. SILVERSTEIN © N.A.S.

**Advice from a native:** An Adélie penguin lays down the law to expedition member Charles Hollister at the Cape Royds rookery, 20 miles north of the U. S. station at McMurdo Sound. The team adopted the penguin as its emblem.

839

beside the three forlorn tents we called Camp II (page 850). Soon the other two members of our expedition, Barry Corbet and John Evans, would return from a crucial reconnaissance.

So far, our American Antarctic Mountaineering Expedition had done well. Behind us were successful first ascents not only of the Vinson Massif but also of Mounts Shinn and Gardner, the third and fourth highest peaks on the frozen continent. But Tyree?

**Treacherous Ridge Confronts Climbers**

As we stood in the blue-shadow cold, occasionally swinging our arms to stir circulation in our fingers, we realized there was a good chance that we might fail.

All of us questioned the obvious but ticklish route across the catwalk ridge that linked the summit of Gardner to Tyree. And beyond the ridge lay the long climb from the ridge's col, or saddle.

We were having a hard time finding a good route even to the col. Brian Marts and John Evans had managed to reach it by a series of descending traverses over steep snow slopes banded with rock. We did not relish carrying heavy loads down that treacherous staircase.

Now John and Barry Corbet were seeking a better way to the col by descending a steep slope near Camp II (page 853). They had strung a handline between aluminum stakes and rock outcrops—"fixed rope," we call it.

Suddenly Corbet and Evans appeared, burdened by coils of rope.

"They retrieved the handline!" someone shouted in dismay.

That meant the new route did not go. If we were going to climb Tyree, we would have to cross the summit of Gardner after all. It was a nasty prospect—enough to make us wonder how we ever came to face frustration in such a desolate place.

I gave thought to my rugged companions and ruefully concluded, "If *this* party can't climb Tyree, we are going to give that mountain quite a reputation!"

Each man with me was an expert mountaineer: Barry Corbet, professional guide and participant in the American Mount Everest Expedition of 1963\*; John Evans, a conqueror of El Capitan in Yosemite Valley and of an extremely difficult ridge on Mount Logan; Eiichi Fukushima and Richard W. Wahlstrom, mountaineering instructors from the University of Washington.

Then there were Charles D. Hollister and Samuel C. Silverstein, M.D., veterans of the difficult first ascent of Mount McKinley's southeast spur. At 23, climbing guide Brian S. Marts was our youngest man. For his fifth visit to Antarctica came Dr. William E. Long, Assistant Professor of Geology at Alaska Methodist University and mountaineer on three continents.

Peter K. Schoening and I filled out our ten-  
*(Continued on page 847)*

\*The American conquest of Everest was described in three articles in the October, 1963, *Geographic*.

OPPOSITE PAGES FOLD OUT



**Lonely and rugged** stands the Sentinel Range, northern half of the Ellsworth Mountains. This spectacular four-page panorama, assembled from five Kodachromes, spans more than 50 miles. To the north, clouds obscure Long Gables (1), 13,620 feet above sea level. Four men

reached the summit on January 12, 1967. On the same day another four conquered Ostense (4), 13,710 feet, climbing behind the sloping ridge on the mountain's left flank. Unclimbed: Viets (2), more than 11,800 feet; Giovinetto (3), 13,400; Morris (5), 12,500+.

**Massive brow of Gardner (7)**, rising 15,575 feet, guards the way to Tyree (8), 16,290. From Base Camp (B) near the foot of Shear (6), 13,100+, climbers hacked a route to Camp I. They established Camp II, out of sight on a plateau behind the ridge, and attained the summit of

Gardner on December 31, 1966. Then came the toughest struggle of the expedition. A team descended the back of Gardner and set up Camp III on a col of the Tyree ridge. Following a perilous route over the arête, they reached Tyree's summit on January 6th.



REPRODUCED BY NICHOLAS E. CLINCH © N.E.C.

**Human huskies**, hauling a loaded sled, begin the long march toward the Sentinel Range. On December 7th, the U. S. Navy flew climbers and gear to a point 20 miles from their objective. The Navy earlier had landed gasoline for a motorized toboggan, or snow scooter, to be used in pulling the sleds. When two searches for the fuel proved fruitless, this

party of six started a man-haul toward Vinson, right. Meanwhile, three men filled the motor toboggan's tank with cooking gasoline to make a final hunt for the precious fuel. After five hours the cache, hidden by undulations in the ice field, was found, and the snow scooter raced to the weary haulers, who had covered only seven miles in a day.



REPRODUCED BY NICHOLAS E. CLINCH © N.E.C.


**In midsummer's constant light**, Shinn (10), 15,750 feet, glistens with its mantle of snow. Like Gardner and Epperly (9), 15,100+, Shinn bears the name of a U. S. Navy pilot. In 1936 Lt. Comdr. Conrad Shinn landed a party at the South Pole, the first at the bottom of the

world since explorer Robert F. Scott in 1912. The American mountaineering team began their ascent of Shinn from Camp II high on a col to the right of the mountain. Ascending a spiraling route, they reached the peak on December 21, 1966.

Antarctica's giant, Vinson Massif (11), 16,860 feet, climaxes the southern end of the range. The name honors Georgia's Carl Vinson, former Chairman of the House Armed Services Committee. The climbers established a route from Base Camp, over a low ridge to Camp I,

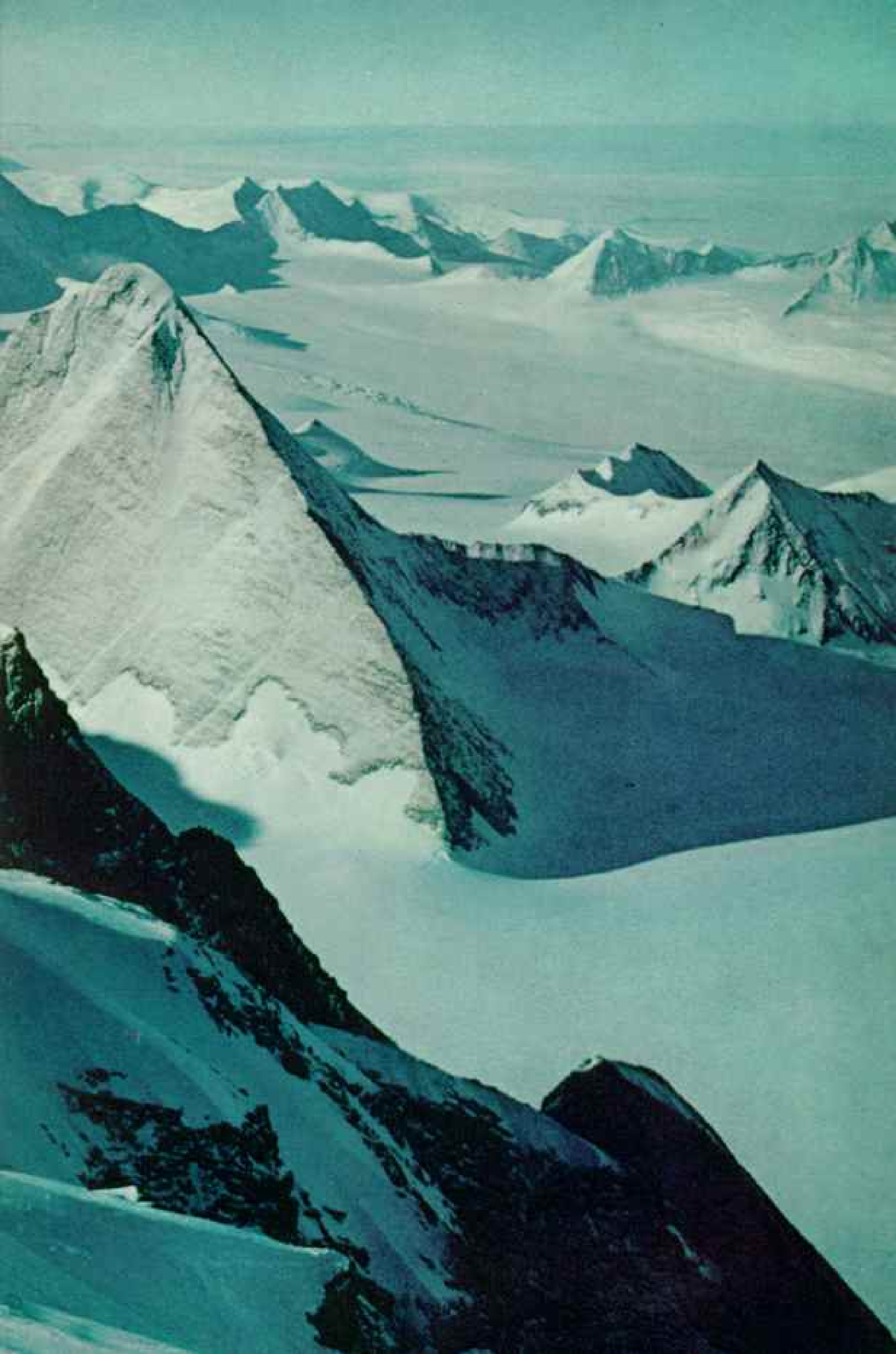
then up an icefall to Camp II. From Camp III, the assault of December 18th was achieved. Camera angle makes the unnamed peak at right—also part of the massif—appear to be higher than Vinson's crest, but the explorers' measurements proved it to be lower.





ALONE IN THE REALM OF ICE-KINGS,  
*mountaineers trudge from Gardner's  
summit toward rest and food at Camp II.  
The closest outpost of civilization  
lies 450 miles away, at Byrd Station.  
Razor-edge ridges, sharpened through  
eons of erosion, slice northward  
beneath the chill blue sky.*







**History-making exploration begins:** Lincoln Ellsworth, veteran of the first trans-Arctic Ocean flight, prepares to take off from Dundee Island on the first air journey across the Antarctic Continent. With pilot Herbert Hollick-Kenyon, Ellsworth climbed toward the unknown on November 23, 1935, in his single-engine plane, *Polar Star*. On the first day, Ellsworth spied “a solitary little range . . .” (above). “I named it Sentinel Range

and its central peak Mount Mary Louise Ulmer, for my wife . . .” wrote the explorer in the July, 1936, *NATIONAL GEOGRAPHIC*. The colossus of the range, Vinson, lay behind blending snow and clouds. At one of four stops, a blizzard grounded the flyers for eight days (right). They laboriously dug their plane from the clutch of snow. Ellsworth, the smaller of the two, wriggled into the tail section and bailed out the flourlike snow with a mug.





© ELLSWORTH ANTARCTIC EXPEDITION

After 22 days and 2,300 miles, the *Polar Star* landed—out of gas—near the Bay of Whales, its destination. In honor of his extraordinary exploits, Ellsworth received the National Geographic Society's Hubbard Medal from the hands of President Franklin D. Roosevelt at the White House, April 15, 1936.



man team. In 1953 Pete had stopped five falling men at 25,000 feet on K-2; he had later led the successful climb of Kashmir's Hidden Peak.

The Vinson Massif dominates the Sentinel Range of the Ellsworth Mountains (foldout, pages 839-42). The range lies 450 miles east of Byrd Station, the nearest human habitation, and 1,350 miles east of McMurdo Station, the Navy's main support base for U. S. scientific activities in Antarctica. In the Sentinels we were a long way from the local grocery store.

Lincoln Ellsworth discovered the Sentinel Range during his epic 1935 transcontinental flight from the Antarctic Peninsula to Little America.

"We came abeam of a solitary little range," he wrote,



"to which I took bearings. It was symmetrically formed, with a central pyramid rising to 13,000 feet and dwindling down at either extremity to merge into the surrounding plain. I named it Sentinel Range . . ."

Ellsworth never saw the main part of the range, which lay to the south, hidden under a thick cloud cover. The highest mountains in Antarctica remained undiscovered until 1957, when the crew of a U. S. Navy plane, flying reconnaissance for an International Geophysical Year traverse party, sighted the jagged peaks. That American traverse party reached the Sentinel Range in December, 1957, and established the heights of the major peaks.

Since that first ground survey, geologists under Dr. Campbell Craddock of the University of Minnesota had studied the more accessible rock formations of the Sentinels. And the U. S. Geological Survey had mapped the area.

But no party had attempted the major peaks in the Sentinels, and Antarctica remained the sole continent whose highest summits had not been attained by man.

Under the auspices of the National Science Foundation, which administers the U. S. Antarctic Research Program (USARP), the American Alpine Club sought to back an expedition to the Sentinels during the Antarctic summer of 1966-67. Assurance of financial support from the National Geographic Society, and of logistic support from the Navy, gave us the go ahead. Our principal goals were first ascents of the Vinson Massif, honoring in its name Carl Vinson, former



Chairman of the House Armed Services Committee, and of Mount Tyree, named for Rear Adm. David M. Tyree, Commander of U. S. Navy Forces in Antarctica in 1959-62 (page 851). A major objective was to sample ancient rock strata and to look for fossils high in the central mountain area.

### Eggs and Explorers Head for "the Ice"

In Christchurch, New Zealand, on December 6, 1966, we climbed aboard a Navy-manned C-130 Hercules for the 8½-hour flight to "the Ice," as old hands call Antarctica.

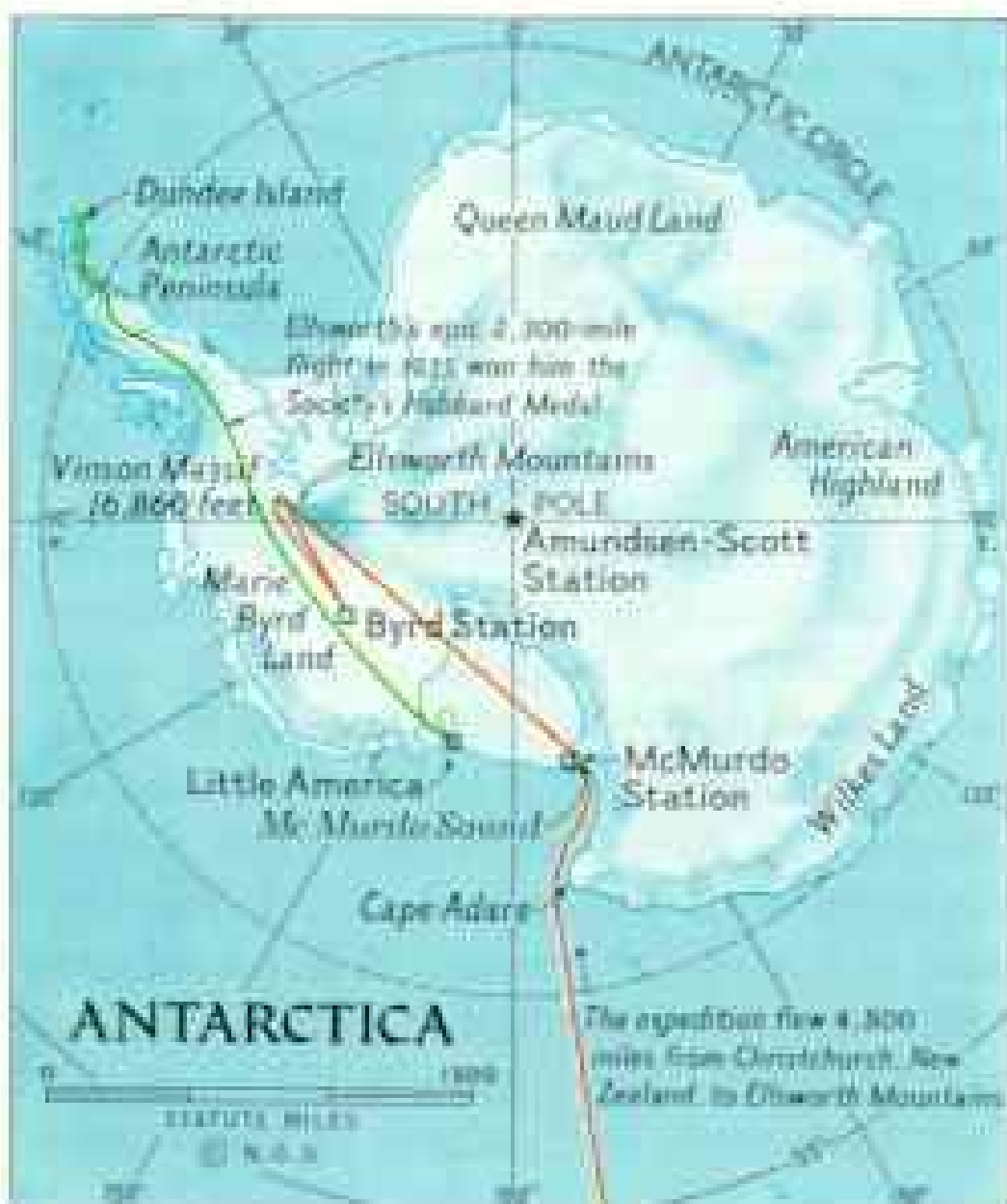
Our party was honored by the company of Rear Adm. Fred E. Bakutis, then Commander of Operation Deep Freeze. Supplies bound for the main U. S. base at McMurdo Sound included crates of fresh eggs stacked high over my head. I hoped the landing would not make me one ingredient in a giant omelet.

As we flew over Cape Adare, the admiral pointed out the window, and I stood to peer down at ships grinding southward through the pack ice—the annual supply fleet, led by the Coast Guard icebreaker *Glacier*.

Soon we were descending to McMurdo, and I returned to my seat under the egg crates. Not a shell cracked as we landed.

At McMurdo, Jerry Huffman, USARP representative, helped us round out our gear, adding two Nansen sleds and a Polaris motor toboggan, fondly dubbed "lawnmower with skis" (pages 851 and 860). We also picked up radios, generators, and antennas.

At 5 p.m. on December 7th, our ski-equipped C-130 lumbered into the air with



Frigid blasts abate as Barry Corbet leaves his shelter at Vinson Camp I to inspect damage from a two-day storm. Winds as high as 80 miles an hour savagely buffeted the tents. A hastily grabbed shovel shored up a bending tent pole during the height of the blizzard.

Less fortunate, men at Base Camp (right) had to struggle out of shelters that collapsed during the storm. Equipment blew as far as two miles down the glacier. Even as they began picking up the pieces, Dick Wibistrom, left, started digging a snow cave for emergency shelter in future blows.

Wind is the demon of Antarctica. Like the Sahara, the continent has scant precipitation, averaging less than six inches annually. But constant cold preserves the snow for years, and the explosive wind drives it like the sand of desert dunes.



KODACHROME BY JOHN F. EVANS (TENTS AND SLED) FURUSHIMA © R.A.S.





Proud and defiant, Tyree lifts its sun-drenched head above Gardner Camp II. For seven days the mountain remained inviolate while the team searched for the best route. "We never had a good choice; we just had to find the least evil one," said the author. "We finally had to climb the fourth highest mountain in Antarctica—Gardner—to climb

the second highest—Tyree." A bone-wearying descent of Gardner's steep face established Camp III on the col, veiled by clouds at right, that bridges the two mountains. From here, at 5:30 a.m. on January 6th, Evans and Corbet began laboring across the tortuous ridge, circumventing barrier towers along the way. Twelve and a half hours later—victory!





PHOTOGRAPHS BY WILLIAM J. COBB © N.S.S.

Stalwart as his namesake mountain, Rear Adm. David M. Tyree hoists the United States flag above Amundsen-Scott Station at the South Pole in February, 1962. Now retired, the admiral directed Operation Deep Freeze in support of the U.S. Antarctic Research Program for nearly four years.

PHOTOGRAPHS BY NICHOLAS E. CLINCH (BELOW) AND NATIONAL GEOGRAPHIC PHOTOGRAPHER ALBERT WILDHART (LOWER) © N.S.S.



Power-driven pack horse, the motor toboggan hauled men and supplies from mountain to mountain. "Without it," says Clinch, "we could never have climbed six peaks." Here in the bright Antarctic night, Corbet goes to check on the team climbing Long Gables. The vehicle, gripping the snow with cleats on revolving chains, pulls two Nansen sleds, developed by Norwegian explorer Fridtjof Nansen.



Comdr. Fred Schneider at the controls and Admiral Bakutis aboard for consultation and any last-minute decisions. After 4½ hours, we saw the Sentinels looming up through an ice fog. Puffs of cloud on the peaks accentuated their immense size.

A thousand feet above the summit plateau, Commander Schneider circled Vinson to permit us to take photographs and reconnoiter possible routes. Then we flew westward.

"I'm going back about 50 miles to see if we can get under the cloud cover," the pilot shouted over the engines' roar.

We started under, but the cloud cover lowered toward the undulating icecap, squeezing our visibility to zero, and we flew back as far as Byrd Station, where we rested.\*

Ten hours later we were again over the Sentinel Range. Clouds still blanketed much of the icecap, but the commander decided to land anyway. We derived little comfort from knowing that a Navy R4D had crashed near here in 1961. Fortunately, no lives had been lost.

### Tropical Consignment Detours Via Antarctica

Commander Schneider made several approaches with his monstrous airplane, feeling out the uncertain surface as gingerly as a man testing a tub of hot water with his toe. At last the skis brushed the surface, tentatively—once, twice—then we were down. When we clambered out onto the ice sheet, we were already at an elevation of 8,500 feet.

We were leaving the last real warmth we would know for 40 days and 40 nights. I say "nights" only in the clock sense; at that midsummer season, the sun never sets. But the cold was numbing. Hastily we hauled out our gear and said goodbyes. The giant aircraft swung around, taxied back along its landing tracks, charged toward us, and was airborne. Dipping its wings in farewell, the silvery shape vanished to the west.

Sorting out our supplies, I spotted a strange box. On it, beside the expedition name, was written, "Hawaiian Wedding."

"What's in that?" I asked. No one knew.

We opened the box. Out tumbled ladies' slippers, jars of cold cream, and cooking pots and kitchen utensils. Apparently it had been shoved in with our equipment when we repacked hastily in an airline storeroom in Los Angeles. There wasn't much we could do to rectify the error. We wished the bride well.

Aided by our motor toboggan, we quickly established Vinson Base Camp by moving in gear and pitching tents. The camp lay ringed by crevasses in a cirque. We called it "Sun Valley."

The route up Vinson rose before us, a stairstep sequence of vast snow slopes and wind-blown shelves and plateaus.

The very evening of our arrival we grew restless, challenged by the steep headwall leading up to the first col. The 24-hour sunlight made time schedules meaningless. At the rather odd hour of 6 p.m., Long, Corbet, Silverstein, and Hollister took a thousand feet of rope and attacked the headwall.

They had to chop and kick steps up steep snow and blue ice between scattered rocks. As they climbed, they rigged the fixed rope in place, then started down.

When John and I went out with extra clothing to meet the

Lifeline to nowhere secures John Evans as he rappels down a near-vertical slope from Gardner Camp II. In an effort to find an easier route to the Gardner-Tyree col, Evans and Corbet tried this approach, only to find it more difficult than climbing over Gardner's summit.

In his left hand Evans holds a Jumar, a kind of metal brake, hooked to his body sling. When squeezed, the Jumar allows him to slip slowly down the rope. Should he lose his footing, he releases the Jumar, and its teeth grab the line, keeping him from falling.

In much easier fashion, the expedition investigated—and discarded—another possible approach to Tyree. From the plane the climbers had seen a promising route on the mountain's east slope, but they would have to find a way down a sheer cliff to reach it. How far? Cautiously four men pushed the largest boulder they could find over the edge of the Gardner plateau. Eiichi Fukushima counted until the boulder appeared again—eight, nine, ten seconds. Then a speck emerged more than a thousand feet below in tiny puffs of snow. Schoening sighed and said, "Scratch another route."

RECAPTURED BY EIICHI FUKUSHIMA © R.G.S.

\*For a description of this extraordinary snow-tunneled U. S. scientific station, see "New Era in the Loneliest Continent," by Rear Adm. David M. Tyree, USN, NATIONAL GEOGRAPHIC, February, 1963.







returning climbers, the first thing Sam Silverstein said was, "Do you have any water?" Despite the below-zero cold, the hard work of climbing and descending had made them hot and thirsty.

The climb up the headwall, to what we named "Sam's Col," cleared the way for the final assault on the Vinson Massif. Just beyond the col, at approximately 11,000 feet, we established Camp I, two four-man tents. Camp II we pitched in a high col between Mount Shinn and Vinson's summit plateau.

#### Winds Nearly Cripple Expedition

On December 13th the good weather broke. Clouds covered the plateau below Base Camp, and white streamers flew from the summit of Shinn. After ferrying a load of supplies up to Camp I, I stayed there overnight with Long, Corbet, Schoening, and Evans.

The wind swelled to a steady roar. Bill Long and I lay in our sleeping bags and watched the frame of our tent twist in the gale. Around 3 a.m. I noticed that the windward side was sagging.

"Bill, that pole is bending!" I yelled.

Long pulled on his boots and went outside. In a couple of minutes he was back with a shovel, which we propped against the bending tent pole. We piled our down clothing and boots near our heads and discussed what to do if the tent came apart.

"We can always retreat to Base Camp," Bill said. We went to sleep to the howling of the storm. In their tent next door, Corbet, Evans, and Schoening put in a restless night.

"Our tent was billowing in and out like an accordion," said Pete next morning. "I'm glad the two tents were tied together—at least we wouldn't have blown down the glacier alone!"

We couldn't reach Base Camp at the 9 a.m. radio contact, but at noon we got through, to hear Charley Hollister's voice:

"Camp I, this is Base Camp. Base Camp is flattened. Repeat. Base is flattened. All tents are down. Skis and equipment blown down the glacier. All five of us are in the cook tent, and we have lowered the tent pole. Over."

That night the wind turned gusty: The tent popped like a machine gun, hour after hour.

But the gale finally subsided. By the time I returned to Base, the whole camp had been

**Marshmallow topping** of snow cloaks Ostenso's summit. Climbers' red parkas resemble tiny cherries on the sundae. A nonstop push, without intermediate camps, brought Wahlstrom and Evans to the crest just after midnight. A powdery surface hampered them on the final leg.

Like an overloaded ant, Dr. Samuel Silverstein slogs up the lower slopes of Vinson Massif with his lightweight outer clothing lashed to his backpack. "A constant climbing problem was maintaining heat balance," he said. To keep perspiration to a minimum, he strips to lower layers of clothing. When the wind freshens or he stops, Dr. Silverstein will quickly put on down-filled parka and pants.

RESEARCHER: DR. SAMUEL C. SILVERSTEIN (OPPOSITE) AND CHARLES H. HOLLISTER (THIS PAGE)



resurrected. Tents were repitched and heavily guyed, the skis had been recovered, and most of the equipment had been retrieved in a giant Easter-egg hunt (pages 848-9).

#### All Ten Climbers Scale Vinson

We mustered our forces for the final assault on Vinson. On December 17th Pete Schoening, Bill Long, John Evans, and Barry Corbet plodded their way up the icefall above Camp I and started south across the plateau toward the summit. Three miles farther on, after threading some crevasses, they pitched the two tents of Camp III at 14,800 feet.

On the bitter-cold morning of December 18th, the foursome slogged on up the plateau and angled across the summit ridge. At 11:30 a.m., after a short pitch up very steep snow, they reached the highest point in Antarctica—the 16,860-foot summit of Vinson.

The climbers achieved a special objective in coming to the pinnacle of a continent—planting the flags of the 12 nations that signed the Antarctic Treaty of 1959: Argentina, Australia, Belgium, Chile, France, Japan, New

Zealand, Norway, the Republic of South Africa, the U.S.S.R., the United Kingdom, and the United States. This unique treaty sets apart Antarctica as a "continent of peace," where only pacific goals will be pursued.

Our first party also planted flags of our principal sponsors and supporters, the National Geographic Society and the U. S. Antarctic Research Program. The four elated climbers absorbed the wide-flung view over the Sentinel Range and the ice plateau. From a rock outcrop close to the top, John Evans collected a sample nearly a foot long.

Reluctantly, the men started down.

In two groups of three, on December 19th and 20th, the rest of us plodded to the summit of Vinson Massif (pages 837-8), adding our signatures to the first page of the Sierra Club register that we placed there.

While the two follow-up parties were climbing Vinson, Bill Long and John Evans descended the glacier to a rock outcrop. Geologic evidence suggested that here they might find the oldest rock in the Sentinel Range. It would be quartzite, of which the mountains are





chiefly composed, a formation that bears the name "Crashsite quartzite" in commemoration of the landing less successful than ours.

Bill and John returned to Camp I with a pack full of specimens, which they added to a growing collection of rock taken from heights never before reached by man. When analyzed, the samples will help close gaps in the geological map of the Sentinels. There is still the possibility that some will yield fossils.

A few rocks above Camp I supported a scant growth of lichens. They were the only form of life we found in these mountains.

Camp II in the Vinson-Shinn col was an ideal starting point for climbing Mount Shinn, third highest Antarctic peak. It honors Lt. Comdr. Conrad S. Shinn, pilot of the plane that in 1956 made the first South Pole landing.

Within four days all of us climbed Shinn. The summit gave us a vertiginous view along the spine of the Sentinels, northward across the top of Epperly to Tyree. This was one of the routes we had been considering for the assault on Tyree. But rock buttresses and near-vertical snow slopes looked so formidable

that we at once decided to seek an easier way.

Christmas Day found us reunited at Base Camp. We were clear of the Vinson Massif, closing out the first phase of the expedition.

We crowded into the cook tent for a late Christmas dinner. Once again our gratitude went to our Navy hosts at McMurdo, who had thrust upon us 120 pounds of filet mignon.

Dick Wahlstrom fried steaks to order. Brian passed around candy canes sent along by his girl friend. Sam produced a very small bottle of brandy which, with due ceremony, was poured into a very large pot of tea.

#### Team Faces a "Gale-whipped Tightrope"

Now our major challenge, the brutal bulk of Tyree, confronted us. The choices were not reassuring—the long ridge from Mount Epperly, which we had already virtually discarded; Tyree's appallingly precipitous west face (a 7,000-foot cliff); and the ridge from Mount Gardner. Of the ridge, Bill Long said it resembled "a gale-whipped tightrope."

Luckily, we quickly spotted a feasible approach to Gardner itself. From the ice sheet



PHOTOGRAPHS BY SAMUEL C. SILVERSTEIN (MIDDLE) AND CHARLEY HOLLISTER © N.S.E.

Bravery can be a bath in subfreezing Antarctic weather. With warmth from the sun's reflection on the snow and only breeze enough to flutter the lightweight American flag, Wahlstrom, Silverstein, and Evans douse one another with lukewarm water from melted snow. Standing on waterproof mattress pads at Gardner Base Camp, located in a snow bowl, they soap, rinse, and dry—very quickly.

Navy bounty provided dinner—filet mignon. Charley Hollister (above) dishes up from the pair of two-burner stoves. Potatoes, beans, and carrots complete the meal. "With perpetual daylight," said the author, "time got away from us. Sometimes we found ourselves eating breakfast at four o'clock in the afternoon."



Gigantic portal sculptured by the wind frames two lonely figures and the ice-cap beyond. Only nunataks, or tips of mountains nearly drowned by the ice, break the white monotony of the continent's vast frozen cap, here more than a mile thick. "We jokingly dared one another to cross the fragile bridge," said the author. "Fortunately, no one was foolish enough to try."



PHOTOGRAPHS BY ARTHUR G. SILVERSTEIN  
OPPOSITE AND EDGE TYREKAMA © R.A.S.

**Ice beard sprouts** on Evans's face. In the constant subzero temperatures, breath crystallized almost instantly. Some members of the expedition tried face masks, but they soon discarded them. The mask channeled the breath upward to fog or freeze on snow goggles.

we found a long snow tongue that led steeply 4,000 feet up the west face of the mountain to the lower lip of its summit plateau.

As we were shifting camp from Vinson to the base of Gardner, I noticed one box smaller than the rest. On the side was inscribed "Hawaiian Wedding." Our cardboard albatross still hung around our necks.

Two days of hard work put steps and fixed rope up the snow chute as far as a rock buttress, and there we placed a four-man tent, our Camp I for Tyree.

Our basic challenge in attacking Tyree was the crossover from Gardner. From aerial reconnaissance and maps, we knew that the ridge looping down and across from Gardner's summit was narrow and very difficult.

East of the ridge both peaks fell away into the vast gulf of a snow-filled cirque. We thought that we might be able to drop off Gardner into the cirque, then ascend uncomplicated-looking snow slopes to the ridge.

#### Moose Bellow Opens Radio Contact

Intercamp radio contact normally occurred at scheduled times, usually 9 p.m. On Gardner we employed a more efficient system. If someone at Camp I wanted to talk with Base Camp, he would simply walk out, bellow like a wounded moose, and Base Camp, two-thirds of a mile below, would turn on the radio.

So at 11 p.m. on December 29th we at Base heard Brian's call of the wild and established radio contact with the reconnaissance party. They had found a sheltered site for Camp II high on the Gardner plateau (pages 850-51).

"But the back side of Gardner is very steep," reported Brian. "It looks as though we'll have to cross the summit of Gardner to reach the col on the Gardner-Tyree ridge."

Preoccupied with climbing and logistics, I suppose we gave all too little thought to our environment, to our somewhat frightening isolation. But on my frequent descents of the snow-filled gully of the couloir below Camp I, facing outward over the endless polar icecap, I sometimes shivered to contemplate the empty, frozen distances.

The silence at times filled me with awe and an ache of loneliness. The emptiness and quiet reminded me of my responsibility for ten lives. But reassurance always came with flooding confidence in our emergency backstop, the radio link that kept us in touch, over that pearl-gray horizon, with the U.S. Navy—alert, ready and able to help.

Brian Marts and John Evans left on December 30th to make the first ascent of 15,375-foot







**Loading up:** The motor toboggan hauls remaining supplies and rock samples to a C-130. Giant skis supplement conventional landing gear on the plane. An Antarctic rarity—a fresh snowfall—made take-off difficult. Taxiing back and forth, the pilot packed the snow. Then, firing JATO bottles, he finally lifted from the ice.

**Happy conquerors,** wearing beards and snow tans, return to McMurdo. From left, standing: John Evans, Minneapolis, Minnesota; Richard W. Wahlstrom, Edmonds, Washington; Nicholas B. Clinch, Pasadena, California; Barry Corbet, Jackson, Wyoming; Peter K. Schoening, Seattle, Washington; kneeling: Charles D. Hollister, Falmouth, Massachusetts; Samuel C. Silverstein, New York City; Brian S. Marts, Seattle; William E. Long, Anchorage, Alaska; Eiichi Fukushima, Seattle.

Gardner and reconnoiter a route between Gardner and Tyree.

The slope down from Gardner to the ridge joining it to Tyree was the steepest yet encountered. Brian and John, in 20-below-zero cold, found much of it to be solid ice. They reported this way “not impossible, but a darn poor choice.”

At 1:30 a.m. on New Year’s Day, Pete, Sam and I, snug in our sleeping bags at Camp I, were casually discussing the hazards of mountaineering. We had just agreed how lucky we were that light snowfall and low temperatures kept falling rock and avalanches from being much of a threat in the Sentinel Range. Overhead, all at once, we heard the whir of a flying rock pass over the tent. A small fragment slapped the side.

“That’s interesting,” said Pete quietly. The three of us got up, lined up our packs on the outside wall of the tent, the better to protect our heads, and returned to our sleeping bags.

A storm raged on New Year’s Day, and everyone stayed holed up in the tents. Next afternoon, when Pete, Sam, and I arrived at Camp II, Barry and John had just set out on their fruitless attempt to find a better route to the Gardner-Tyree col.

#### Assault Begins by the Ridge Route

When Barry and John returned to report that their route did not go, we suspected that we had no alternative but that “darn poor choice”—to try for the col by way of Mount Gardner. It was that or give up.

At noon next day Barry and John struck out—two men burdened with coils of all the fixed rope we had at Camp II. From the Gardner summit they would establish a route down to the knife-edge Tyree col.

A few hours later, Bill, Eiichi, Sam, and Charley followed the other two. They carried gear and supplies to set up Camp III in the col—one tent, stove, fuel, and food. Then the support party retreated to Camp II on the Gardner plateau. From here on, it would be up to Barry and John.

January 4th brought clouds and wind—no day for the assault that lay ahead. Barry and John lay in their tent all day.

The wind slackened, and on the fifth the two bearded climbers, linked together by a 160-foot rope, set out on their first attempt on Tyree from the col. For the first time they had to make heavy use of mountaineering hardware—pitons and carabiners, roughly equivalent to rock spikes and rope clips.

The 6 p.m. radio contact brought gloomy news. Barry and John had reached the top of the first tower on the ridge. They couldn’t get down the far side. They had turned back.

I lay awake at Camp I, mulling over our predicament. How many days would it take to try a drastic new solution—to climb over the range by the Shinn-Epperly col and hike around to the eastern side of the range? Eight days? Ten? Too many. We were scheduled for pickup on January 15th. No—if Barry and John could not climb Tyree from Camp III, we simply would not get up. We had no further choice.

Early on January 6th John and Barry left Camp III for what had to be their final attempt on Tyree. Listen to John Evans tell about the struggle for the top.

“By dropping down steep snow on the east flank of the mountain,” John later told us, “we were able to bypass the tower on the ridge that had stopped us before. Then we got back on the crest by a steep couloir.

"The ridge was strung with rock pinnacles—the mountain's inner defense, crenellated towers on a crumbled Great Wall of China. We alternated leads: One of us would anchor to a piton or to a rope sling thrown over a rock, while the other led upward. On every steep pitch, the leader climbed the full length of the 160-foot rope.

"Soon we came to an immense pinnacle that forced us down and out on the sheer face of Tyree. From this detour, we were able to loop back up to the high col."

The climbers sheltered among boulders to eat their lunch of peanuts, chocolate, and hot liquid Jell-O. Then, after seven hours of difficult climbing, they found that the most hazardous stretch still loomed ahead.

"Over snow and rock, the route went straight up the wedge of Tyree at a steep angle," John related. "We were in sun, but it was very, very cold. We had to use many pitons for the sake of safety, and it was slow going. The summit seemed no nearer.

"It took us five and a half hours to get up that face. But then, suddenly, we came over a steep snow cornice—and we had it! We stood on the top. Mount Tyree, the rugged old so-and-so, was licked!"

"Look on the Summit, You Lunkheads!"

The mountaineers clapped each other on the back and straightened to look around. It was a few minutes before 6 p.m., and they pulled out the radio to report their victory.

At that very moment, several of us were motor-ing along over the icecap, 15 miles north of Base Camp. We wanted to take a closer look at another big mountain, Long Gables. Over our shoulders we could see the summit of Tyree above the roof of Gardner.

We drew up to make our regular 6 p.m. radio contact. We heard John Evans's casual voice calling Camp II. At least he and Barry were safe on Tyree, but exactly where were they?

Suddenly, out of our receiver, Barry Corbet's voice boomed out: "Look on the summit, you lunkheads!" Obviously people at Camp II had been unsuccessfully searching for them through binoculars.

Exultation flooded over me. We cheered.

Barry and John still had to get down. They descended the face in a series of long rappels, and at 1:30 a.m. reached their lonely tent at Camp III.

The following evening John, Barry, Sam, and Dick returned to Base Camp. They brought down Camps III and II in heavy, heavy



STACHTON BY RICHARD S. CLINER © N.G.S.

Collapsed in a jumble of gear aboard the aircraft, John Evans gives in to the exhaustion of the hard-fought battle against the unrelenting hostility of Antarctica.



loads. As they came in, Charley and I fired red flares into the air. The welcome was lost on the climbers, for their weary eyes never left the snow in front of their feet.

The rest was smooth and sweet, just frosting on the cake. In the few days left, we climbed two more big mountains.

On January 11th I drove Sam, Charley, John, and Dick north to the base of Ostenso, 13,710 feet high. They would attempt Ostenso without camps in one long day's climb.

A long snow slope led them to the summit ridge. Half an hour after midnight they reached the top. The outlook was spectacular. The face dropped thousands of feet beneath them, and the sun shone brightly above low-lying ice fog (page 854).

The last mountain, Long Gables, proved something of a problem. Bill Long wanted to be one of those to attempt this twin-summitted mountain, because its name honored him and his brother Jack, who in 1957 were in the first party to view the Sentinels from the ice.

From a cirque guarded by crevasses, the Long Gables party climbed a thousand feet up an icefall and over "wind-slab"—perilous wind-compacted snow overlying soft fluff. It looked ready to avalanche in great chunks.

"This is no good," said Pete Schoening.

They backed down and attacked anew by Long Gables' west buttress. On January 8th they struggled to within 500 feet of the summit, but high wind turned them back.

For three days it stormed. But clearing skies gave them a fresh start close to midnight on January 11th. A difficult traverse 500 feet below the summit was the key to success on the peak that ranked second only to Tyree in difficulty. This made six mountains that the expedition had climbed for the first time.

For two days we hauled our diminishing possessions to the pickup site. Bouncing along atop a sled behind the toboggan, I looked at a carton under my feet. It was that bad-penny Hawaiian Wedding box!

We maintained radio contact every three hours with either Amundsen-Scott Station, Byrd Station, or a party led by Dr. Craddock along the Marie Byrd Land coast. Late on January 16th Bill Long seemed to yield to wishful thinking on the weather. Each of our tents had two entrances, facing north and south. Bill had peered out the south door, and we heard him report skies partly cloudy.

Out the north tent flap, the vista was of clouds banked up black and threatening. We

made Bill take another look. He quickly transmitted a corrected weather observation.

"What's the penalty for tempting a C-130 in with a wrong weather report and then have it not able to land?" asked Brian.

"You get to winter over," answered Pete.

An hour later, on a radio contact through the South Pole, we learned that the weather forecasters at McMurdo considered conditions satisfactory for flying and an aircraft was already en route to pick us up. We had just finished packing our tents when the plane swept in over the horizon, at 1:45 a.m. on January 17th. We touched off a big smoky fire of empty boxes, sleeping pads, and gasoline.

The plane landed, and the pilot kept the outboard engines running as we pushed our loaded sleds up the cargo ramp. Many pounds of rock samples would go with us, as well as field notes showing the tilt of the Crashsite quartzite at higher elevations.

We also took away a photographic record of glacial striations up to 1,000 feet above the present level of the icecap, indicating that it had once stood at a much higher level.

Then there was a final item on our checklist for departure: "(1) Hawaiian Wedding box; return to airport, Los Angeles."

### Cruel Environment Challenges Men

After a long take-off run, JATO bottles finally got us unstuck from the soft new snow. We glimpsed our mountains for the last time.

As we slowly unwound in the languid warmth of the plane's cabin, I turned over in my mind all that had happened. To veteran mountaineers of world-wide experience, certainly the Sentinels had given their sport and craft a new dimension.

But Antarctica itself would not change. Inches away—just outside the cabin—was the most unforgiving environment in the world, waiting to pounce on mistakes.

From dog teams and pemmican to airplanes and steak, from sealskin-clad whalers to flight-suited naval airmen, man's continuing relationship with this beautiful but hostile land finds an eloquent epitome in an excerpt from Tennyson's "Ulysses." The weathered inscription is carved on a rough wooden cross atop Observation Hill at McMurdo Sound—a cross placed there in memory of Capt. Robert Falcon Scott and four companions who died sledging back from the South Pole in 1912. The words are, "To strive, to seek, to find, and not to yield." \* \* \*

# First La Gorce Medal Honors Antarctic Expedition

“NICHOLAS CLINCH brought to this daring undertaking a talent for organization and a devotion to purpose that made a difficult task look deceptively easy. His high resolve was an inspiration to his men. And the goals his team attained stand as a record eminently worthy of the high honors the John Oliver La Gorce Medal represents.”

With these words, the Chief Justice of the United States, the Honorable Earl Warren, presented the National Geographic Society's new La Gorce Medal to the American Antarctic Expedition, Nicholas B. Clinch, Leader, before 2,550 members and guests of the Society in Washington, D. C., on March 31, 1967.

Bronze replicas of the gold medal for

Deeds in the splendid tradition of geographic exploration—scaling the loftiest peaks of Antarctica—earn Nicholas B. Clinch and his team the first John Oliver La Gorce Medal. Chief Justice Earl Warren (right) and Dr. Melville Bell Grosvenor, President and Editor of the National Geographic Society, make the presentation in Washington's Constitution Hall.

From left, front row: Dr. Leonard Carmichael, the Society's Vice President for Research and Exploration; Adm. Horacio Rivero, Vice Chief of Naval Operations; Dr. Thomas O. Jones,

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"contributions to science and exploration through the first ascent of Antarctica's highest mountains" were awarded to the other nine team members and to the United States Navy, National Science Foundation, and American Alpine Club for their invaluable support.

Presiding at the impressive ceremony in Constitution Hall, National Geographic Society President and Editor Melville Bell Grosvenor said, "In my many years at the Geographic, I have never known an expedition to be run more efficiently, more smoothly than this one."

He paid affectionate tribute to the late Dr. John Oliver La Gorce, "who gave me my first job at the Geographic and taught me all those

years when we worked so closely together.

"It's appropriate," Dr. Grosvenor observed, "that the new medal should be presented to Mr. Clinch and his teammates by one of Dr. La Gorce's personal friends and associates. Chief Justice Warren has been a member of the Society's Board of Trustees since 1955." He expressed the Society's deep appreciation of the Chief Justice's faithful attendance at board meetings and his wise counsel.

In making the first presentation of the medal, the Chief Justice said in part:

"I am especially pleased to be associated with the ceremony that both honors a group of resourceful young men and pays homage to Dr. John Oliver La Gorce. It is a highly

National Science Foundation; Lawrence G. Coveney, President, American Alpine Club; and Dr. Melvin M. Payne, Executive Vice President of the Society. The U. S. Navy, Alpine Club, and Science Foundation collaborated with the Society in supporting the expedition.

Team members from left, second row: Richard W. Wahlstrom, Peter K. Schoening, Eiichi Fukushima, John Evans, Dr. William E. Long, Brian S. Marts, Charles D. Hollister, and Dr. Samuel C. Silverstein. One climber, Barry Corbet, was unable to attend (page 860).

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EXHIBITION BY NATIONAL GEOGRAPHIC PHOTOGRAPHY IN CONSTITUTION HALL

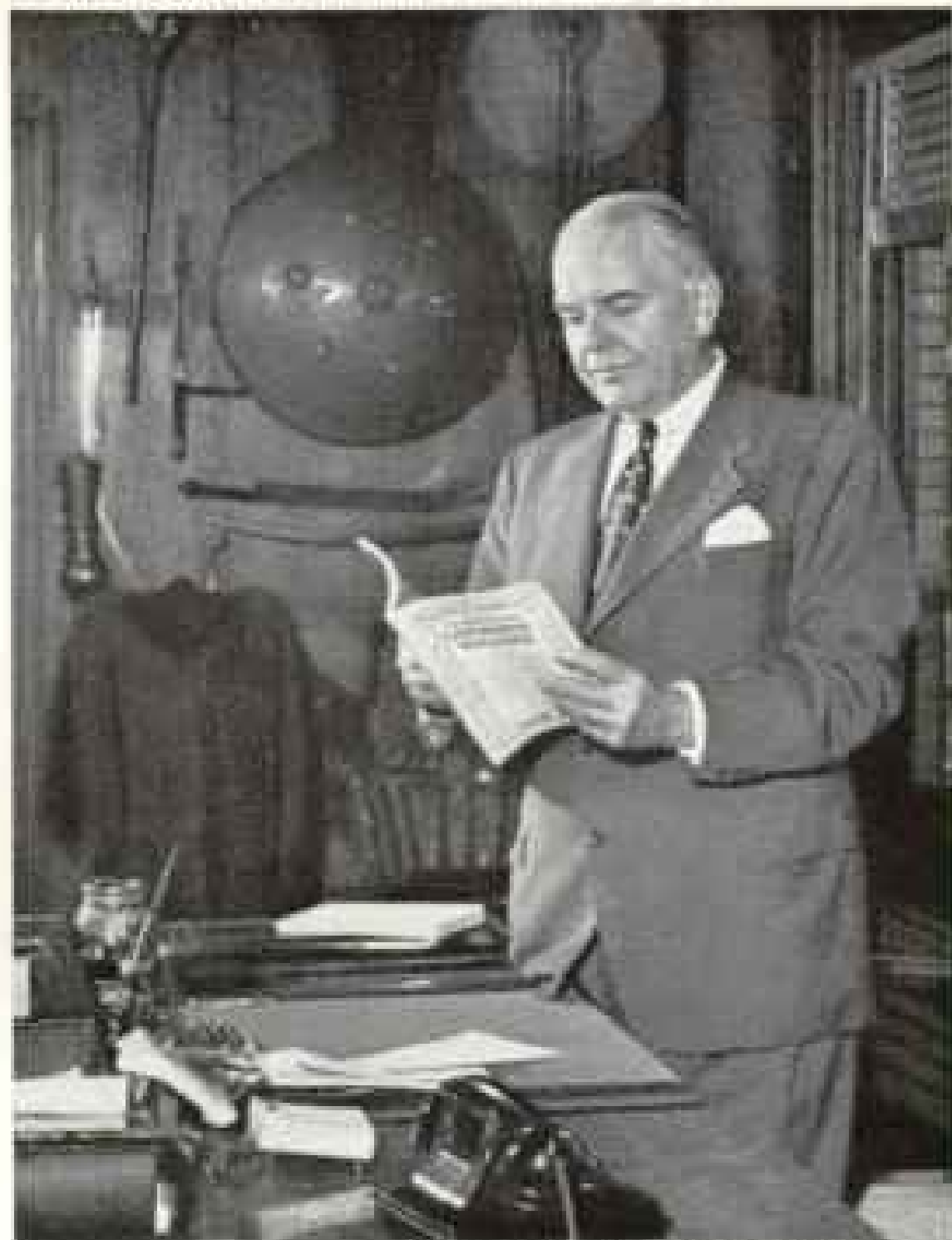




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AND EXECUTED BY PETER V. MARINI AND RONALD E. FRANK © N.S.S.



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WILLARD W. COCKER (LEFT) JOHN OLIVER LA GORGE



**Devoted to geography,** John Oliver La Gorce (1879-1959) served the Society for 54 years, beginning in 1905. Said Dr. Gilbert H. Grosvenor of his Vice President and Associate Editor, "With everything the Society has done since, he has been associated. Many of our useful and interesting projects he originated." Dr. La Gorce served as President and Editor from 1954 to 1957.

Now the Society's Trustees have honored him by creation of the John Oliver La Gorce Medal for "accomplishment in geographic exploration, or in the sciences, that contributes to geographic knowledge, or for public service that advances international understanding." It reproduces Dr. La Gorce's great 1920 photograph of a square-rigger off Florida.



appropriate coincidence that the first La Gorce Medal should be awarded for an Antarctic exploit, for Dr. La Gorce held a keen interest in that icy continent. He took special pride in his appointment as honorary postmaster of Little America during Rear Adm. Richard E. Byrd's 1933 expedition. A mountain range and a peak on the continent carry Dr. La Gorce's name."

The Chief Justice recalled that in this very hall in 1935 the Society welcomed Byrd and his men home from Antarctica."

"The National Geographic has honored other great polar explorers on this stage, and the American Antarctic Mountaineering Expedition carries on this splendid tradition. This team reached the top of Vinson Massif, 16,860 feet, the highest point in all Antarctica, and scaled five other lofty peaks in the frozen south.

"The American Antarctic Expedition was a complete success. It is a tribute to the generalship of the expedition's leader that the assault on Antarctica's highest mountains went so smoothly. Remember, ladies and gentlemen, this is a forbidding realm where even the slightest error can bring disaster. Mr. Clinch himself summarized the dangers of mountain climbing in Antarctica when he said before the expedition, 'If anything goes wrong at Vinson Massif, the nearest help is Byrd Station, 450 miles away.'"

Accepting a bronze replica of the medal on behalf of the Navy for its logistic support was Adm. Horacio Rivero, Vice Chief of Naval Operations. Lawrence G. Coveney, President of the American Alpine Club, received the award for his group, which organized the climbing team and picked the leader. For the National Science Foundation, which served as coordinating agency, Dr. Thomas O. Jones, the Director's Special Assistant for Antarctic Affairs, accepted the honor.

#### Mysterious Square-rigger Epitomizes Geography's Lure

Dr. Grosvenor complimented Society Executive Vice President Melvin M. Payne for guiding the design of the medal, which was executed by Peter V. Bianchi and Howard E. Paine of the GEOGRAPHIC staff. It reproduces a once-in-a-lifetime photograph snapped by Dr. La Gorce in the Gulf Stream off Florida—an old square-rigger under full sail. He called it "The Argosy of Geography" and wrote: "There was no name on her bow or stern, and only the helmsman was on deck. I watched her sail on until she disappeared and have never learned any more about her."

Said Dr. Grosvenor: "To Dr. La Gorce the romantic old vessel and its mystery epitomized the lure of geography."

"I would like to add a word of commendation to the Society's Committee for Research and Exploration. This hardworking body, under the chairmanship of Dr. Leonard Carmichael, reviews every proposed expedition. Before the committee recommends to the Trustees the support of any project, it must prove to be scientific research or exploration of the highest order.

"Mountains are laboratories. Mr. Clinch and his very able team are to be congratulated, not only for conquering the highest mountains of the Antarctic Continent, but for carrying out vital research in geology and paleontology. The expedition proved once again that exploration combined with science produces great adventure."

THE END

\*The Society encouraged and helped finance Admiral Byrd's 1928-1930 expedition, which achieved man's first flight over the South Pole, and strongly supported his second expedition in 1933-35. The NATIONAL GEOGRAPHIC published reports by Byrd on four of the five expeditions with which he was associated (see the issues for August, 1930; October, 1935; October, 1947; August, 1956, and July, 1957).



ETCHING BY JOHN LEWIS STALL, PHOTO HELLAYCHERE, INC. © N.G.S.

Like voyageurs of yore, canoeists portage around a frothing waterfall in British Columbia. From wilderness to city, the splendors of Canada unfurl in a new National Geographic book.



ETCHING BY GERALD BRIMCOMBE © N.G.S.

Lances at the "carry," horsemen drill to rousing tunes during the Musical Ride of the Royal Canadian Mounted Police at training headquarters in Regina.

## Your Society Offers Four New Books

By MELVILLE BELL GROSVENOR  
LL.D., Sc.D.

President and Editor, National Geographic Society



**T**HROUGH THE GALES and snowdrifts of a Christmas blizzard last year, a young family from Virginia drove the highways of Pennsylvania.

Toward dusk they parked beside the ice-choked Delaware River at the very spot where George Washington's troops crossed on Christmas night of 1776. The four children explored the riverbank, prodded the ice floes with sticks, and wallowed through deep drifts. Then by flashlight their father read them a diary kept by one of Washington's aides:

"Christmas, 6 P.M.—The regiments . . . are marching toward the ferry. It is fearfully cold and raw and a snowstorm setting in. . . It will be a terrible night for the soldiers who have no shoes. Some of them have tied old rags around their feet; others are barefoot,

but I have not heard a man complain. . . 3 A.M. . . The troops are all over, and the boats have gone back for the artillery. . . I have never seen Washington so determined as he is now. He stands on the bank of the river, wrapped in his cloak. . . The storm is changing to sleet and cuts like a knife."

Those words made a profound impression on the children. They had already felt the same intense cold that Washington's men had endured.

"They could actually relive a moment of history," their father, Bart McDowell of the Society's senior editorial staff, told me. "And that is my goal as author of this book: to help our readers experience the Revolutionary War as vividly as we did."

Other families next Christmas will be

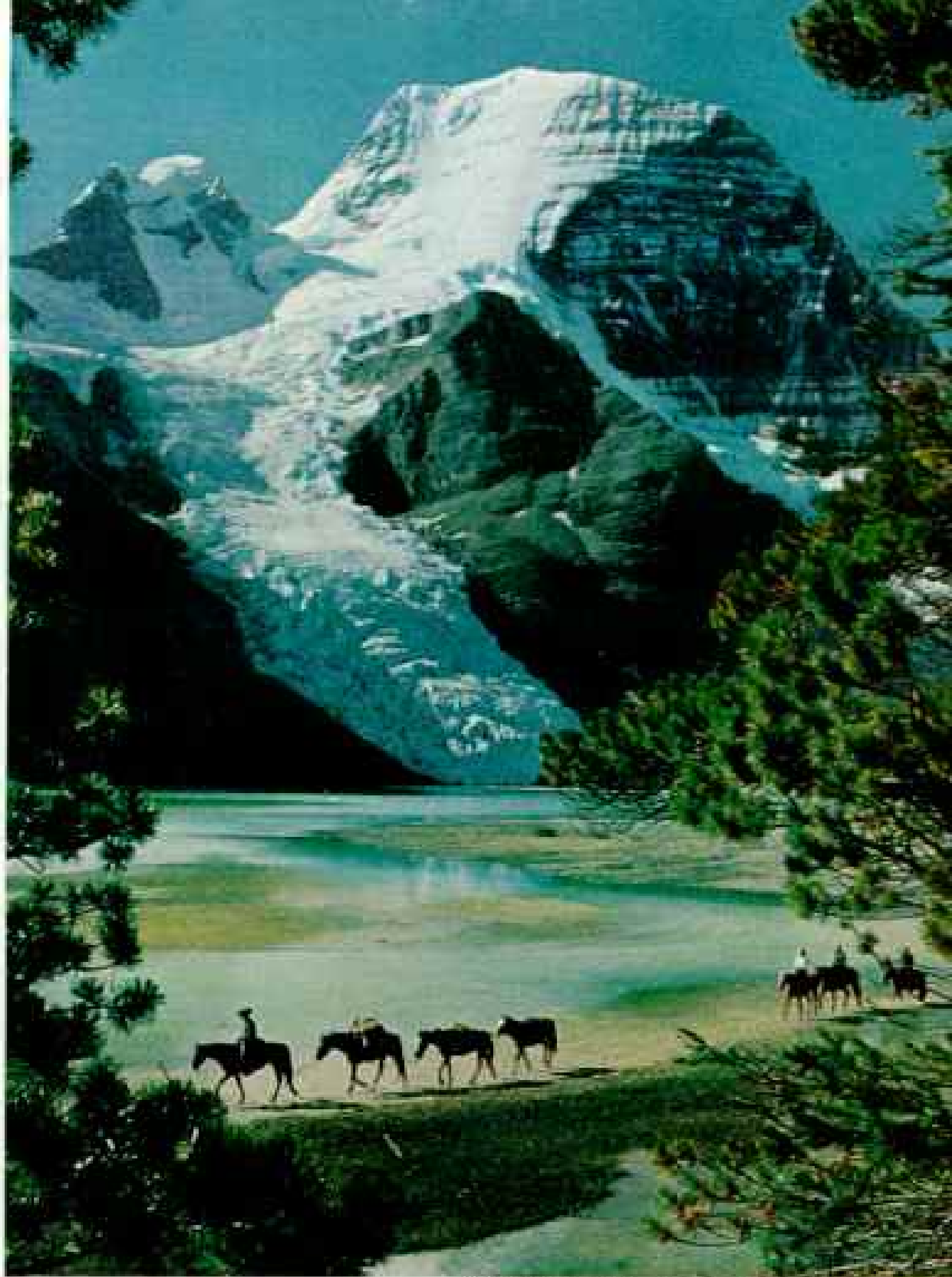
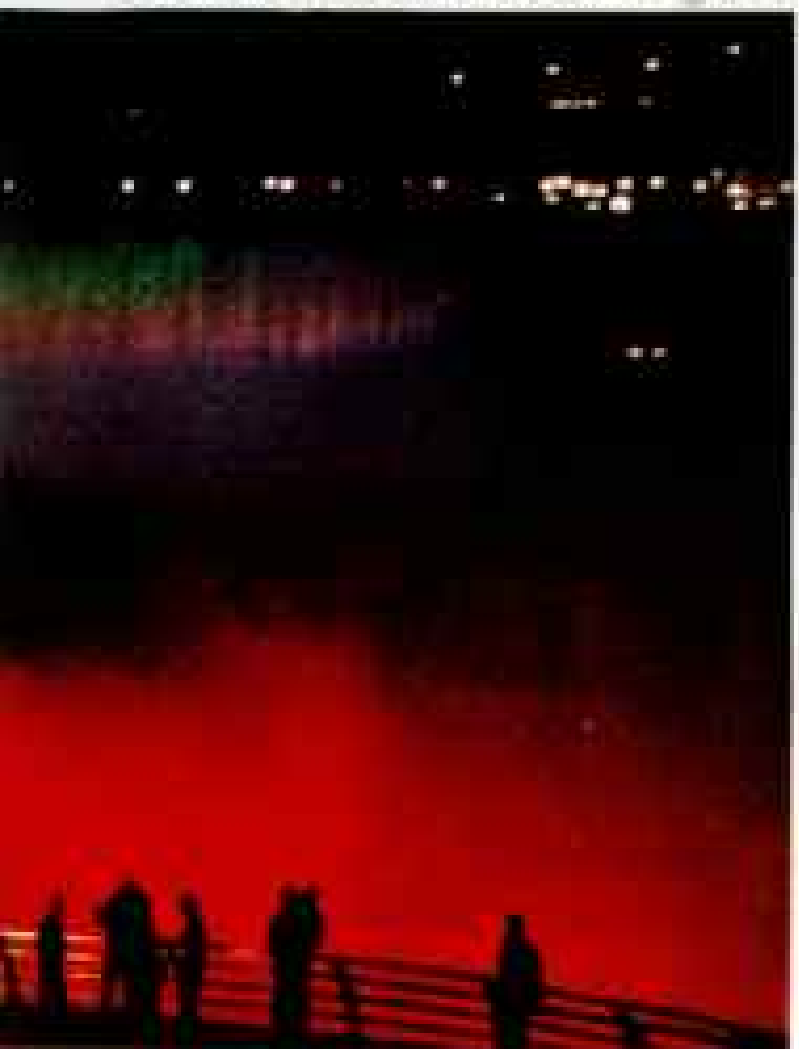




EDDACHITHINE BY CHARLES STEINHACKER © N.C.S.

Freckled lass in Stewart tartan hearkens to the skirl of bagpipes at Nova Scotia's Pugwash, where street names appear in Gaelic and English.

EDDACHITHINE BY WALTER HEFFNER EDWARDS © N.C.S.



EDDACHITHINE BY JAMES L. SHARFIELD © N.C.S.

Tumbling Glacier crunches down Mount Robson, highest peak in the Canadian Rockies, and dips into Berg Lake beyond a pack train.

Honeymoon lasts for the good neighbors who share Niagara Falls and the electricity generated by its waters. Spotlights set fire to American Falls and turn Horseshoe Falls green.

enjoying that book. *The Revolutionary War: America's Fight for Freedom*, one of four volumes in the Society's 1967 series of Special Publications. Subjects vary widely—from Canada to the South Seas, from the Revolutionary War to the latest in underwater exploration. But the purpose of each modestly priced book is the same: to awaken new interests for the whole family. Whether the reader is a mature scholar or a grade-school pupil, exceptional color illustrations attract, instruct, and hold his interest through 200 pages.

Though only one year old, the program has met with marked success. Members have enjoyed more than 800,000 of these books.

With such a reaction to our first series, it is a particular pleasure to announce the next four books.

*Exploring Canada From Sea to Sea*, the first in the new series and now available, has great immediate appeal. This summer millions of visitors will travel to Montreal's glittering Expo 67, held in celebration of the Canadian Centennial.\* Many will drive on toward the Maritime Provinces to see the rebuilt fortress of Louisbourg, where our own Colonial forefathers fought heroic battles. Other travelers will head toward the Canadian west to sample the grandeur of unspoiled nature.

*Exploring Canada* is not a guidebook, yet its half a dozen expert authors provide many practical ideas on camping, dining, festivals

\*See "Canada Marks Her First Century," also by Dr. Grosvenor; "Montreal Greet the World," by Jules B. Billard; and "The St. Lawrence, River Key to Canada," by Howard La Fay—all in last month's *GEOGRAPHIC*.

## World Beneath the Sea



Stranger than a dream: Arms writhing, a six-inch squid hunts for food in Florida waters.

Moon-faced sub passes a test run off Turkey as Dr. George F. Bass, foreground, develops techniques of underwater archeology. Cameras on the two-man sub will take stereophotographs of sunken ships.

Filefish and friends welcome a diver to John Pennekamp Coral Reef State Park, Florida, first undersea preserve in the U.S.



EXTRACTS BY ROBERT A. SCHROEDER (1991), JERRY GREENBERG (1992), AND DOUGLAS FULLMER (© N.C.S.)



Stinging fingers of a sea anemone on a Pacific reef have no effect on the skunk clownfish. The book *World Beneath the Sea* tells of pioneer divers and their amazing realm.

to attend, weather, and how to have fun. More than that, our *Canada* tells the history, the lore, the flavorful background of this "complex nation, sired by France, suckled by Britain, and nurtured by the United States," as Canadian author Alan Phillips has written.

We explore "the necklace of pearls," the great cities that swing across Canada's southern belt within 200 miles of the U.S. border. Cliff-hung Quebec, where major battles for possession of Canada were decided; Montreal, with its handsome skyscrapers and spacious plazas; and the spire-crowned hill of Ottawa, with its scarlet pageantry and imposing river-side vista—all pass in review.

Canada's natural beauty is captured in the book's color photographs. We go to Texas-size Alberta and marvel at the greatest oil reserves known to man. At Calgary we attend the annual Stampede, then drive along the spine of the Rockies and visit the crown jewels of Canada's parks: Banff, Yoho, Jasper. Then we come down from the mountains to the



CHRONOMETER BY BATES LITTLEHALLS NATIONAL GEOGRAPHIC SOCIETY

shining ports of the Pacific coast; the cameo city of Vancouver, where residents set their watches by a 9 o'clock gun, and on to quaint Victoria—so English “that it brings tea to the eyes,” reports one of our authors. Later, we trudge over the rocky Chilkoot Trail, following the dream-driven prospectors of 1898 into the gold-rush country.

#### “Inner Space” Holds Exciting Promise

Last December I explored two of the world's most beautiful nature trails. Maintained by the U.S. National Park Service, they lie off the islands of St. John and St. Croix in the Virgin Islands—10 to 20 feet beneath the blue Caribbean. Here, for a view of one of our underwater parks, I put on snorkel and flippers to follow a guide through fantasies in coral, canyons and grottoes, and crystal water flashing with brightly colored tropical fish. Waterproof signs and pictures along the bottom told me the names and habits of the plants and animals I saw as I floated effort-

lessly above them. What a thrilling sight!

This new kind of park is only one of many things you will see and read about in *World Beneath the Sea*, the second book in our series. The author, James Dugan, wrote a history of underwater exploration, *Man Under the Sea*, which has been translated into seven languages. He has collaborated with Capt. Jacques-Yves Cousteau on *The Living Sea* and several other books.

In our new book we dive with the author in a hydro-jet-propelled, two-man Diving Saucer to Conshelf III. Here, in the Mediterranean off Cap Ferrat, we visit six men living for nearly a month 328 feet beneath the sea. We also watch life at other undersea stations, all preparing for the day when man may build villages, farms, and factories beneath the ocean.

We read of man's early attempts to invade the sea depths in bells and iron helmets; of the invention of the Aqua-Lung, and of the new miniature submersibles, like those of Edwin A. Link, designed for deep-sea research.



## The Revolutionary War



ILLUSTRATION BY BEN FLEETWOOD © N.G.S.



"The sacred cause," Gen. George Washington called the American War of Independence, inspiring his men to endure cold, fatigue, and hunger at Valley Forge. Accompanied by the French volunteer, the Marquis de Lafayette, at right, Washington questions a sentry. Last winter NATIONAL GEOGRAPHIC senior staff man Bart McDowell and his family (above) relived those desperate days on a visit to Valley Forge State Park, Pennsylvania. Such experiences helped author McDowell write with feeling about the Revolutionary War.

We trace your Society's long sponsorship of undersea research, beginning with Dr. William Beebe's record-breaking 3,028-foot dive off Bermuda in 1934.

The book describes the pleasures of scuba diving—and the dangers. It tells of hunting treasures off Greece, the Riviera, and Florida. It explains the new science of underwater archeology in expeditions headed by Dr. George Bass, Peter Throckmorton, and others.

No prize in the sky holds more exciting promise than that salty realm of our planet called "inner space." *World Beneath the Sea* gives the story of its exploration.

### Our Nation's Fight for Independence

The third book in the 1967 series is *The Revolutionary War: America's Fight for Freedom*. I have already mentioned the way author Bart McDowell has shared this project with his family. The McDowells started with a special advantage: They live near George

Washington's home at Mount Vernon. Their weekend trips to historic places like Philadelphia and Williamsburg launched a family hobby that grew with the years. They took an intensely personal view of the Revolutionary War, seeing it in terms of people as real as their neighbor George Washington.

We go with them in July to Independence Hall, Philadelphia, to relive the signing of the Declaration of Independence. (Old Benjamin Franklin consoles an impatient Thomas Jefferson as Congress edits the young man's draft. "I was not insensible to these mutilations," Jefferson admits.) In the dead of winter we visit Valley Forge, where the rag-bound feet of soldier-patriots bled in the snow.

At the "memory-haunted monument" of Fort Ticonderoga, on a hill between Lake George and Lake Champlain, we meet that robust spirit Ethan Allen.

Here, on a May dawn in 1775, Allen and his Green Mountain Boys surprised the sleeping



PAINTING BY JOHN WARD DUNSCOMB, COURTESY, HOME OF THE REVOLUTION, FRANCIS TAYLOR, NEW YORK

British garrison, forced their surrender, and captured badly needed cannon.

Throughout this book, we focus on the personalities who made history. We see their houses and tents, their ships and guns, and even read their newspapers. Stirring days come alive again.

### South Pacific Spells Adventure

Of all the books the Society has ever published, the one I would most like to have written myself is *Isles of the South Pacific*, fourth in this year's series. I have been a sailor all my life, and it has been a dream of mine to sail through these storied South Sea isles of Captain Cook, Herman Melville, and Captain Bligh and the *Bounty* mutineers.

But time and work have not permitted, and so, like the rest of us, I must read—with pleasure, but with a certain envy, too—the story of these romantic islands as told by two outstanding New Zealand writers, both experts

on the area. One is Maurice Shadbolt, whose articles on Pacific and Asian lands have appeared in the *NATIONAL GEOGRAPHIC*. The other is Olaf Ruhen, author of several books on Melanesia, the chain of islands stretching from Fiji to New Guinea.

With Shadbolt we fly to Tahiti and Moorea in the Society Islands, bits of Polynesian paradise recently opened to jet-age tourism. We visit American Samoa, where the airplane has caused sudden, dramatic changes, and to Western Samoa, a republic resisting modernity.

For contrast, we sail through the Cook Islands to the atoll of Penrhyn, where 700 Maori live on the edge of nowhere in an isolation broken only by a rare freighter, which may stop to exchange food, soap, and cigarettes for copra and mother-of-pearl. If Captain Cook could visit his islands today, he would find that most have changed little since 1773.

And for those readers who think that adventurous travel is a thing of the past, let me



share part of our recent correspondence with author Ruhlen. A letter lists his address: "At Sea, off Bellona, The Solomons," one of the Pacific names so familiar to World War II veterans. He explains, "I'm on the last leg of a three-day trip to the smallest of the Polynesian enclaves in Melanesia. . . . This 60-foot copra boat is rolling like the dickens. . . ."

An earlier note from Suva, in the Fiji Islands, remarks, "I will be taking a field trip with the District Commissioner, an old acquaintance, to mountain villages and a launch trip down the Rewa River. . . . On Friday I shall visit a fantastic character who has made pets of ocean-dwelling giant Fijian codfish near an island off Raki Raki."

Members' response to the first four books in our Society's new program (*Our Country's Presidents*, *The River Nile*, *Isles of the Caribbees*, and *My Friends the Wild Chimpanzees*) has been enthusiastic: "A stunning piece of work" . . . "Great assistance to me on the faculty of this school—and source material for our students" . . . "Superb books at modest price, within reach of all" . . .

All four books in the latest series are bound in hard covers, stamped in gold, and brilliantly illustrated in color. We are able to offer them at a surprisingly modest price only because of the cooperation of National Geographic Society members who reserve their copies in advance.

THE END





## Isles of the South Pacific



ROBINSONS BY LOUIE WARDEN (LEFT) AND ROBERT B. SHIDMAN © N.G.S.

### HOW TO RESERVE YOUR BOOKS

A PROMPT REQUEST will bring you first editions of the four clothbound books as they are published: *Exploring Canada From Sea to Sea*, 208 pages, available now.

*World Beneath the Sea*, by James Dugan, 200 pages, available in August.

*The Revolutionary War: America's Fight for Freedom*, by Bart McDowell, 200 pages, available in November.

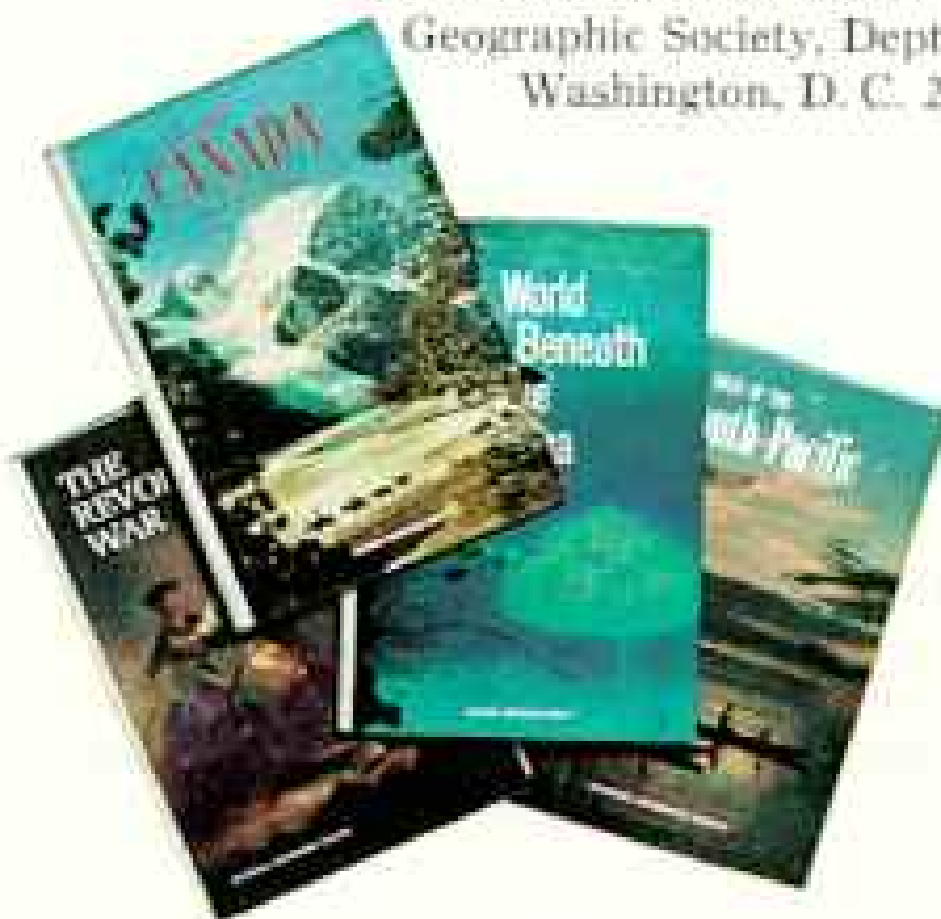
*Isles of the South Pacific*, by Maurice Shadbolt and Olaf Ruhen, 200 pages, available in February, 1968.

Send no money with your order. You will receive a bill with each book for \$4.25 and postage.

Address reservations to National Geographic Society, Dept. 405, Washington, D. C. 20036.

"A magic about these islands . . . is time defying," wrote the late author James Norman Hall, a long-time resident of Tahiti. Sunlit waters draw a wahine to Pao-pao Bay on nearby Moorea, little changed since 1777, when English explorer Capt. James Cook first saw it. Following traditions of their forefathers, Samoans plan a torchlight fishing trip (upper right).

From Tahiti's warm beaches to the icy fiords of New Zealand, *Isles of the South Pacific* captures an ageless charm that has promised paradise to generations of seafarers and soldiers, painters and mutineers, tycoons and tourists.



CARIBBEAN GREEN TURTLE

# Imperiled Gift of the Sea

By ARCHIE CARR, Ph.D.

Photographs by  
ROBERT E. SCHROEDER, Ph.D.

**T**HE BIG GREEN TURTLE stranded in the surf and rested there for a while, making up her mind. It was the end of her long nesting migration. She blinked and peered into the night, then nosed the wave-washed black sand, as if to smell for telltale signs of other generations of her kind. I crouched low beside a log, savoring the sight of a sea turtle coming in to the beach.

It is a stirring thing to see the ponderous water creature come ashore for her single nesting venture in two or three years. The first stages of her landing are not often seen by anyone. The turtle comes by night and is wild and skittish when she first touches shore. Even the flash of a match far up the beach may scare her back into the sea. For several minutes she may stay there in the wash, pushing her head this way and that in her first prospecting, with quick movements more like a lizard or snake than a 350-pound turtle.

Since that first time fifteen years ago, I have walked turtle beaches every summer. Only a few times, in strong moonlight or, eerily, on pitch-dark nights with the surf breaking phosphorescent like rolling fire, have I again seen this cautious first leaving of the sea.

Once a green turtle has dragged herself up onto the dry, wind-blown upper beach and has begun to nest, she loses her shyness. By the time the eggs start dropping, a dozen Indians drumming dance beats on her shell would not disrupt her ceremony.

At the edge of the first vegetation, or beside the

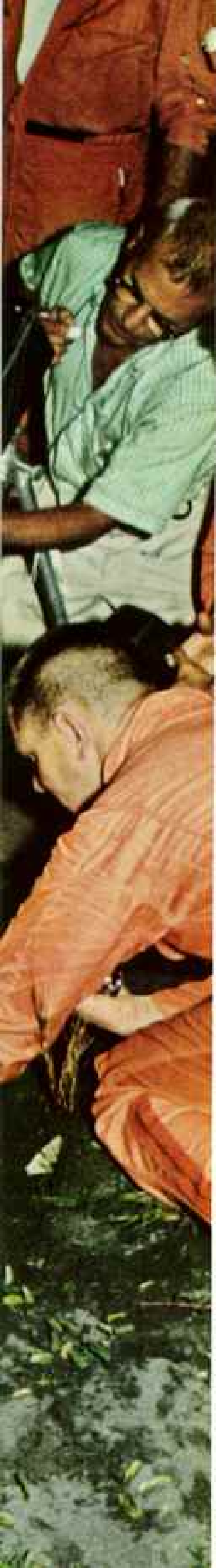
The world pops into view when a minutes-old green turtle escapes from its leathery egg. Scientists hope to learn how the mature *Chelonia mydas*, heavier by 300 pounds than this silver-dollar-size hatchling, finds its way across trackless oceans to nesting beaches. They also hope to re-establish the once plentiful turtle as a valuable food resource in the Caribbean.











rise of a dune or log, she swipes at the sand with her front flippers, thrashing out a pit to rest in while laying. Delicately she shapes the urn of the nest hole, and into this drops a hundred-odd eggs, filling it to the neck (left and below). After that she covers the nest and throws sand about to conceal the site, then slowly makes her way back to the sea.

The Caribbean green turtle (*Chelonia mydas*) matures at about 250 pounds, but often grows to twice that size. In the warm, clear edges of the Caribbean, schools of them move placidly across submarine pastures, grazing the waving turtle grass like flat-backed cows.

#### Green Turtles Fed Colonial Navies

The green turtle is probably the most valuable reptile in the world and offers an expansible food resource for the future. But increased hunting pressure has taken heavy toll of its once-great numbers. There is a ready market for frozen turtle meat, a growing demand for clear green turtle soup, and a rising commerce in turtle hides for leather. Also, sales of stuffed young sea turtles are brisk in curio shops. The price on *Chelonia's* head is therefore steadily mounting, and the species could soon be wiped out.

Big, succulent, and easy to catch, the green turtle was an important factor in the colonization of the American tropics. It was abundant and easily kept alive for months with a minimum of care. It went into the pots of salt-water peasantry and the tureens of flagship chefs alike. The British Navy victualed its ships with green turtle to extend cruises in the New World, and Spanish fleets took on turtle for the long voyage back home to Cádiz.

The only flaw in the green turtle resource is that the females have to come ashore to lay eggs. They leave the safety of the sea—where their size makes them almost immune to danger—and expose themselves

Sighing and weeping salty tears, a green turtle deposits her eggs on a Costa Rican beach; the tears wash sand from her eyes and rid her system of excess salt. The turtle, usually shy but unmoved by anything while laying, ignores the author (prone), other scientists, and orange-suited U. S. Navy flyers who help film the drama. She drops about 100 golf-ball-size eggs into a flipper-scooped pit (below) and covers them before ambling seaward. Greens breed every two or three years, digging three to seven nests each time.

Dr. Carr, a University of Florida zoologist, cooperates in a study sponsored by his university, the National Science Foundation, Caribbean Conservation Corporation, and Costa Rican Government. The U. S. Navy, interested in the green's ability to navigate, also assists and ferries baby turtles throughout the Caribbean.



EXTRADROME (OPPOSITE) AND BUDACHWONG © N.A.S.

and their offspring to the hazards of the land.

Still, turtle populations held their own so long as the dangers on shore remained natural ones: jaguars, pumas, and Indians for the mature turtles; gulls, vultures, coatimundis, and other predators for the eggs and young.

It is not possible to say how widely the green turtle nested in colonial days, though certainly there were several rookeries in the western Caribbean, and probably many.

#### Life Begins at Turtle Bogue

Today most of the green turtles of the western Caribbean nest on Tortuguero Beach—Turtle Bogue, the English-speaking Creoles call it—a 22-mile strip of Costa Rica's eastern shore. Elsewhere in the Caribbean, and occasionally in Florida and the Bahamas, they nest singly or in little bands (map, page 883).

Tortuguero remained a turtle breeding

ground because of its isolation. The Rio Tortuguero comes down from the mountains and runs behind the shoreline. Swamps and forests also cut it off from the hinterland.

At the north end of the beach rises 450-foot Cerro Tortuguero—Turtle Mountain—a forest-covered volcanic rock which the shore people believe is a beacon for flotillas of homing turtles. It is just a folk belief, of course. But, as a zoologist, I learned long ago not to discount all folk notions as empty talk.

I went to Tortuguero in 1954, with the first of a series of National Science Foundation research grants, to study the natural history and migrations of green turtles. For one thing, I wanted to test the stories of fishermen and turtle hunters who spoke of the green turtle as a far-ranging migrant and "a better navigator than man." Another goal was to restore former rookeries to old-time levels of

STOCKPHOTO © N. S. A.



Planting eggs by the bucketful, Dr. Carr, left, and associates safeguard the harvest from natural nests by reburying the eggs at the protected Turtle Bogue hatchery in Costa Rica. After two months' incubation in the warm sand, the hatchlings squirm around within the egg until they tear ragged exits in the shells. Then the young use what Dr. Carr calls "a witless collaboration that is really a loose sort of division of labor" to reach daylight.

With bursts of frenzied wriggling they collapse the nest's walls and ceiling. As sand showers down in an ever-growing pile, it builds the nest floor upward, elevating the young until they reach beach level. Here wire corrals thwart the hatchlings, seen life-size (right), in their instinctive attempt to reach the sea.

The Turtle Bogue hatchery raises turtles for research and produces hatchlings for airlift to 28 beaches where greens once nested in Central and South America, Mexico, the West Indies, the Bahamas, Florida, and Texas. By transplanting the turtles, the Caribbean Conservation Corporation hopes to save the species from possible extinction, a threat that comes mainly from the mushrooming market for hides and calipee, or under-shell cartilage, a prime ingredient of turtle soup.



abundance, stocking them with Tortuguero hatchlings. I set up a tagging camp on a two-mile stretch of the Bogue that the Costa Rican Ministry of Agriculture had allotted me. It was manned by graduate students from the University of Florida.

### Navy Ferries Turtle Hatchlings

So far we have marked some 4,200 nesting green turtles at Tortuguero. Each metal tag offers a reward for its return to the university. To date we have recovered 175 tags, all from outside Costa Rican waters—some from more than a thousand miles away.

In 1958, a group of philanthropists formed the Brotherhood of the Green Turtle, which gave rise to the nonprofit Caribbean Conservation Corporation to save biological resources in the Caribbean. Since then we have operated a green turtle hatchery at Tortu-

guero. Additional help came from the Office of Naval Research. Long concerned with the navigational feats of migratory animals, the U. S. Navy began airlifting our hatchlings—and Operation Green Turtle was born.

In the past decade we have sent more than 100,000 baby turtles to 28 different localities in Central and South America, Mexico, the West Indies, the Bahamas, and southernmost Florida and Texas.

The study and conservation of the green turtle has drawn me back to the Bogue year after year. When I first went there, it was being worked intensively by turtle hunters—*veladores* (stayers awake), they called themselves. All night they patrolled the beach to intercept turtles that came ashore, flipping them on their backs. Over each they built a palm-thatch shed to shield the turtles from the broiling sun until boats came to pick them up.

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EXTREME: NATIONAL GEOGRAPHIC SOCIETY





Beating flippers like wings, green turtles can swim nearly as fast as a man runs. Comparatively sluggish on land, young turtles flip-flop across a Cape Sable, Florida, beach (left). At water's edge frantic paddling begins as hatchlings start to swim.

Although found principally in the tropics, Atlantic greens wander sporadically from New England to Argentina; they nest prolifically at Turtle Bogue and Ascension Island. Those hatched on Ascension—midway between Africa and South America—ride the South Equatorial Current to Brazil, where they mature. Tagging indicates that the nesting urge drives them back to Ascension. To find the seven-mile-long island across 1,400 miles of unbroken ocean, the greens must rely on an unknown, inborn navigation system.



In those days the end seemed near for the Tortuguero turtle colony. Today, however, the whole Costa Rican shore is legally protected from turtling. It is against the law to dig up eggs or to disturb any turtle on land.

In spite of restrictions, the inroads continue. The law permits the harpooning of turtles beyond the breaker line. A man good with the iron can often harpoon both the male and female of a mating pair. Boats go back to Limón loaded down with turtles (map, opposite).

#### Poachers Endanger Green Colonies

Even on the beach the killing has not stopped completely. Poachers find it easy to move in behind the thin-spread guards.

I saw a sample of their work on a recent flight from Limón to Tortuguero. It was my first visit to the camp that year, and I asked the pilot, who flew regularly along the beach, how the green turtle crop seemed that season.

"*Hay muchas,*" he said. "Plenty of them. But the poachers are many, too."

He banked seaward and flew along just over the edge of the forest, so I could look down on the Bogue. In a broad zone between high-tide reach and the beach scrub, patches of what looked like torn-up white paper littered the dark obsidian sand.







"Turtle bones," the pilot called out. He nosed the airplane down to a hundred feet and, looking closely, I could see the white patches were bleached shells and bones left by calipee hunters. In most cases they had taken the calipee—the cartilaginous part of the under shell—leaving the turtle to die.

Calipee is the most important ingredient of the famous English clear green turtle soup. It gives the soup its characteristic consistency. Some connoisseurs will reject turtle soup that fails to make their lips stick together. Calipee produces this quality.

#### Natural Sanctuaries Invaded

The demand for it has had an alarming effect on green turtle populations. Light, easy to conceal, and practically indestructible when sun-dried to the texture of rawhide, the three or four pounds of calipee from one turtle brings as much as \$5—more than the whole turtle brought a few years ago. As a result, hunters are killing green turtles in remote places where they were not molested before.

An increasing trade in turtle hides for leather adds cause for concern. This spring a fashionable New York store advertised a new "status" handbag of sea-turtle skin: "Only the underside of the turtle's flippers will do."

The first I saw of the traffic in turtle skins

was at a fishermen's camp just across the pass from our research station. As I walked into the cluster of thatched shacks, I noticed a man carefully salting and rolling the skin of the shoulders, neck, and upper foreflippers of a green turtle.

"What are you doing with the turtle skin?" I asked him.

"Saltin' it," he said. "Eduardo Sung instruc' me how you roll dem to send away."

Sung was a buyer of shark fins, calipee, and tortoise shell. He operated from a little settlement up the coast.

I sat down and watched the workman make a neat parcel of the irregular rag of hide, stow it in a box under a layer of salt, and pick up another skin from a pile. I plied him with questions about the market for skins and learned enough to increase my misgivings over the future of the green turtle. Each new by-product increases the zeal of the hunters, both legal and illegal.

Several seasons ago, before turtling was outlawed, I was walking the Bogue one night without a light, as the turtle hunters do. Suddenly a voice came out of the darkness:

"*Está poniendo* [she's laying!]"

It was Eligio, a spry Nicaraguan who had been turning turtles at Tortuguero every season for 35 years.



that it was fastened to the upper part of one of the turtle's foreflippers. The chunk of wood was a buoy. Some velador had caught the female coming ashore, attached the marker, then skidded her on her back down to the surf.

He had expected that, after righting herself, she would swim out to sea, where she could be hauled aboard a collecting launch. Eligio's turtle had been overlooked and had come back to finish her nesting.

Greens mate near the shore during nesting season. Males do not venture on land. Females lay eggs three to seven times, at 13-day intervals.

From July to November we gather eggs from Tortuguero nests and rebury them in our hatchery, a chicken-wire enclosure where the eggs can incubate undisturbed. A little circular wire fence surrounds each nest to keep out crabs (page 880). This also makes it easy to harvest the hatchlings and to keep track of unhatched nests. The peak of the hatching season, September and October, is a hectic time.

"I was letting her lay," Eligio told me. "But come over and see what a curiosity."

Most of the veladores never take time to let turtles finish nesting, simply because the wait cuts down the number they can turn in a night. But Eligio was a friend of mine, and we had had long talks about the plight of the turtles.

We walked quietly up the turtle track to where it met the coco plum bushes. There, barely discernible in a pit as deep as the depth of her shell, the turtle lay quietly.

I turned on my flashlight, reached down and pulled one of her back flippers aside, and exposed the neat egg cavity beneath them. As I watched, the turtle heaved slightly and two more golf-ball-size eggs bounced together on top of the growing pile.

"What's the curiosity you had to show me?" I asked Eligio.

"Look here," he said. "She came up with cargo besides the eggs."

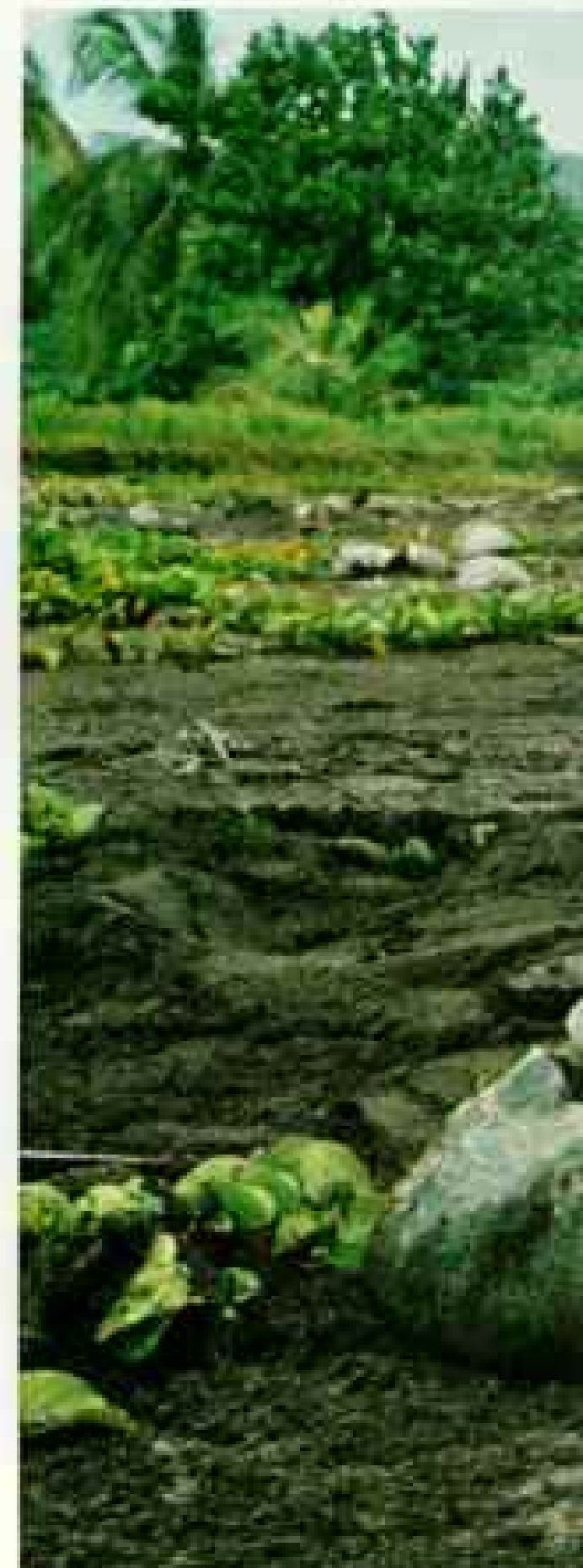
He leaned over and picked up a three-foot length of wood that dangled a rope at one end. Eligio pulled gently on the rope and I could see

**Four-man tow party just manages to move a green to the scales at Turtle Bogue. Biggest green ever recorded weighed 850 pounds; most adults range between 200 and 300 pounds. After measuring the reptile, hatchery workers attach a metal tag to one of her flippers. From among the 4,200 *Chelonia* thus far marked, 175 tags of captured turtles have been returned to Dr. Carr. His tagging system has revealed widespread travels—one specimen marked at Turtle Bogue turned up at Trinidad, 1,500 miles away. Tagging also shows that females rarely change nesting beaches.**

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KODACHROME (REPTILE LEFT) BY RIP REED; CAPTURING BY ROBERT S. SCHNEIDER © N.A.S.





After incubating for about 60 days, baby turtles break out of their leathery eggshells and wriggle up through the sand, usually in the early morning hours. They burst out in flurries of little paddle-footed creatures, each the size of a silver dollar, and all with an inborn frenzy to scramble toward the sea (pages 881-2).

#### Early Habits Remain a Mystery

Every day we find them on the seaward side of their pens, put them in wooden tanks, and feed them chopped fish. When the turtles are about a year old and weigh from two to five pounds, their jaws are strong enough to crop turtle grass. From then on, they are mainly herbivorous. We still don't know what young turtles eat or where they go during their first year in the sea.

The thousands of Tortuguero hatchlings we airlift to other areas may rejuvenate extinct rookeries. We hope that the young turtles, imprinted by the smell, taste, or feel of such release sites as Bimini, or Cape Sable in Everglades National Park, will instinctively return there to breed when they mature.

On a recent Operation Green Turtle stop at Barbados, a ring of spectators watched as we opened six crates and freed 1,200 little turtles on the beach. All scurried across the snow-white sand toward the surf.

"They headin' fo' Tettel Bogue," a young Barbadian yelled.

It is a worrisome thought that the boy could have been right.

To date there is no clear evidence of renewed nesting at former breeding grounds we have stocked. Two important uncertainties trouble the restoration program. One is that nobody

Fitted with goggles that filter sky color, a female kicks up sand (top, left) as Dr. David Ehrenfeld of the University of Florida struggles to right her for a sea-finding experiment at Turtle Bogue. Spread-eagled like a sun-worshiper (above), she wears goggles whose interchangeable lenses depolarize the light or, alternately, let through red, infrared, green, blue, or ultraviolet rays. Blundering off, she eventually finds the water but her zigzag track reveals confusion (right).

Sight rather than sound, smell, or vibration guides females and hatchlings to the sea. This experiment tests a theory that sky coloration steers them. But results from turtles goggled day and night proved to Dr. Ehrenfeld that the brightness of the sea's horizon, not sky color, leads turtles to the water.





knows how long it takes green turtles to reach maturity. They have not been observed under natural conditions long enough for them to grow from hatchlings into breeding adults.

The other uncertainty is whether the transported hatchlings, when mature, will have the urge to go back to where we released them.

Another aspect of sea turtle behavior that is hard to investigate is the creature's ability to navigate in the open ocean. Our tagging studies have shown that the green turtle has a strong homing urge and navigational ability.

So far the process by which they hold courses and make pinpoint landfalls at the end of long journeys is not known. The most likely explanation is that smells of certain localities are carried by ocean currents, and that a sun-compass sense is used to help point the way.

Evidence of navigation has been reinforced by a supplementary tagging program we conducted at Ascension Island, a seven-mile-long speck on the submerged Mid-Atlantic Ridge, about equidistant

PHOTOGRAPHS BY ROBERT E. SCHREIBER © W. S. I.



between Africa and Brazil. When a reconnaissance of the Brazilian coast turned up green turtles in abundance, but no sign of their nesting there, I wondered if they migrated to Ascension—where green turtles do nest.

Our tagging indicated this to be so. Of 556 green turtles marked at Ascension, we have had 10 tag returns, all from the coast of Brazil. The Brazilian turtle colony of *Chelonia* swims at least 1,400 miles to nest on the little cove beaches of the island—without a firm guidepost in all the watery way.

Considering the problems of direction-finding and position-finding that the green

turtle instinctively solves, it is easy to see why the animal excites anybody concerned with guidance systems, as the Navy is.

Several years ago Dr. Sidney R. Galler, then of the Office of Naval Research and now Assistant Secretary for Science at the Smithsonian Institution, asked me if a turtle would tolerate an apparatus bolted to its shell. I said I was pretty sure it would if the device was not too bulky. He was thinking of miniaturized tracking radios.\*

\*One use of such instruments was described by Frank and John Craighead in "Trailing Yellowstone's Grizzlies by Radio," NATIONAL GEOGRAPHIC, August, 1966.



ERRANDS (COURTESY) AND ADDITIONAL © R.E.S.

Blimp bobs above a turtle to aid scientists tracking its course at Turtle Bogue. Tethered to a plastic-foam buoy tied to the turtle's shell, the balloon provides a target for trackers who follow the green from triangulation towers (above). Observers thus learned that the reptiles loaf offshore between trips to the nesting beach.

Scientists have also discovered that mature green turtles surface to breathe every few minutes, and rarely dive deeper than 70 feet.



We have fitted turtles with such radios, but found that the curvature of the earth imposes limitations on transmission. We may soon overcome this problem, however, for NASA has suggested that the facilities of a satellite might become available. Signals from a transistorized turtle could be picked up by a satellite in orbit hundreds of miles above the earth.\*

One of our experiments has offered encouraging evidence about the prospects for tracking turtles by satellite. That evidence arrived

\*See "Telephone a Star: the Story of Communications Satellites," by Rowe Findley, *GEOGRAPHIC*, May, 1963.

one evening at Turtle Bogue, while I was dozing in a hammock. Suddenly I heard a voice out toward the beach say, "3903..."

I jumped to my feet and yelled, "What about 3903?"

"She's back," replied Shefton Martinez. "She came out a little way up toward the pass."

Shefton cooks our meals and doubles as research assistant at the green turtle station. He had been on a routine patrol of the beach that night when he came upon a big green turtle busily covering her nest of freshly laid eggs. A Monel-metal tag on her left front flipper bore the number 3903.

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The turtle had been caught several days earlier on the beach before she could dig her nest. We had coupled to her a plastic-foam float; from the float a big blimp-shaped helium balloon rose on a 100-foot line. The day before she returned to shore she had cruised off the Bogue, towing the apparatus.

In this case the turtle had stayed in sight of land. We tracked her by taking continuous compass bearings from the second-floor porch of the green turtle station and from a tracking tower a mile down the shore.

Significantly, the rig the turtle carried was just as cumbersome as any we would need for electronic tracking. Her return meant that the load had neither killed her nesting

instinct nor interfered with her urge to go back to a specific section of the shore.

This experiment told us that in navigation tests a green turtle can be expected to travel with a load of instruments and go to places we could predict.

There is no telling what the future holds for green turtles. Someday, perhaps only a few years hence, new nesting colonies of them may flourish where they were wiped out long ago. Someday our tagging studies may help solve mysteries of animal migratory guidance, a phenomenon that still is far from being clearly understood. Until that day comes, nobody at Tortuguero expects to get much rest at turtle-nesting time.

890 **ON A STRAIGHT LINE TO THE SEA, a turtle digs a rut that resembles a tractor's track; no goggles now hamper her sight (page 887). Once, the reptiles provided fresh meat for sailing ships' crews, including those of Columbus. Now, if allowed to breed and graze in peace, a replenished tribe could help feed Caribbean peoples.**

LEONARD © N.A.S.



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◀ COVER: Twin beacons of Marina City apartments glow in Chicago, colossus of the Prairie State (page 770).

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## Peter and the King of Thailand

**S**PREADING OUT the National Geographic Society's new map of Viet Nam, Cambodia, Laos, and Thailand, the 39-year-old Thai King discusses his country's progress and problems with staff writer Peter T. White at Chitralada Palace in Bangkok. Sovereigns of the region's oldest independent nation, King Bhumibol Adulyadej and his lovely Queen Sirikit (right) are venerated symbols of stability in a land striving to build for tomorrow while fending off today's Communist-inspired insurgency.

In next month's *GEOGRAPHIC*, Mr. White will tell of his 5,000 miles of travel in Thailand on his fourth visit to Southeast Asia in five years. With photographer Dean Conger, he covered the rubber-producing south, the rice lands of the central plains, the teak-forested north, and the poor and guerrilla-ridden northeastern plateau. Your friends, too, can share exciting journeys like this if you nominate them for membership on the form below.



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Now you *know* that doesn't happen by accident. Obviously, something is fundamentally very right about this car.

#### What are the ground rules?

Some of Valiant's biggest advantages start in closest to the ground. Its wheelbase is 108 inches—long enough for riding comfort, short enough for easy handling and parking. Its suspension has never varied from the originally computed ideal—torsion bars up front, multi-leaf springs in the rear. And its extra weight helps give you a great sense of man over machine.

The brakes are self-adjusting; a chassis lube job is recommended only every 36,000 miles—you can see we're still thinking of your budget every minute.

#### Mileage, schmileage.

Inevitably, someone will ask what kind of mileage you're getting in your Valiant. When that happens, it's only natural to feel a bit smug. For usually you're getting better miles-per-gallon than you have a right to expect. Because economy is a Plymouth specialty. (Witness its class wins in 10 straight Mobil Economy Runs.)

Another thing to remember, while we're on engines. Valiant's Sixes and V-8s were the first in the field with a 5-year/50,000-mile warranty.\* Which tells you something about their stamina and durability. And, of course, we didn't quit perfecting just because they were ahead.

Care about safety?  
Money?

If you're Valiant's kind of people, you do. That's why such basic safety measures as engine in the front and safety rims on the wheels (in case of flats) were part of the first Valiant ever built. Now that everyone's safety conscious, we still do a little extra for our kind of customers. So we have the



Safety ridges

conventional features—and go on from there. With super-silent door latches that are now 50% stronger than ever before. And new Safety-Action inside door handles.

As for money, we've saved the best for last: with all we've accomplished here, we still keep our Valiant 100 2-door sedan list-priced at \$2,117†—

which happens to be lower than 74 models of foreign economy cars.

That ought to give you something to think about until you can get down to your Plymouth dealer's. It's his turn to prove we're out to win you over this year. He's ready and waiting.



†Manufacturer's suggested retail price for standard six-cylinder Valiant 100 2-door sedan. Destination charges, state and local taxes, if any, and optional equipment (including whitewall tires, wheel covers, bumper guards and deluxe interior) extra.

\*Here's how Valiant's new Customer Care Warranty protects you: Chrysler Corporation warrants against defects in materials and workmanship and will repair or replace without charge for parts or labor at any Imperial, Chrysler, Plymouth or Dodge Authorized Dealer's place of business, the engine block, head and internal parts, intake manifold, water pump, transmission case and internal parts (except manual clutch), torque converter, drive shaft, universal joints, rear axle and differential, suspension system (except shock absorbers), steering gear and linkage system, wheels and wheel bearings of its 1967 Valiants for 5 years or 50,000 miles and all other parts for 24 months or 24,000 miles, whichever occurs first, excluding only tires, normal maintenance replacement of spark plugs, condensers, ignition points, filters, brake and clutch lining, etc., and normal deterioration of hoses, belts, upholstery, soft trim and appearance items. Maintenance services required under the warranty are: change engine oil every 3 months or 4,000 miles, whichever occurs first, and replace oil filter every second oil change, clean carburetor air filter every 6 months and replace every 2 years, lubricate front suspension ball joints and tie rod ends at 3 years or 36,000 miles, whichever occurs first; and every 6 months have an Imperial, Chrysler, Plymouth or Dodge dealer certify (i) receipt of evidence of performance of the required services and (ii) the car's then current mileage.



**Plymouth**



**CHRYSLER**  
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# **ITT**

# That's a lot of money. That's a lot of camera.



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And when all the models are light, compact, fast-loading?

And when *all* the models have an electric eye that reads the light of the flash when you shoot color pictures indoors,

and sets the exposure automatically. (You never have to worry about special distance settings.)

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Polaroid went all out on this one.

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It is unquestionably the finest automatic camera Polaroid has ever produced.

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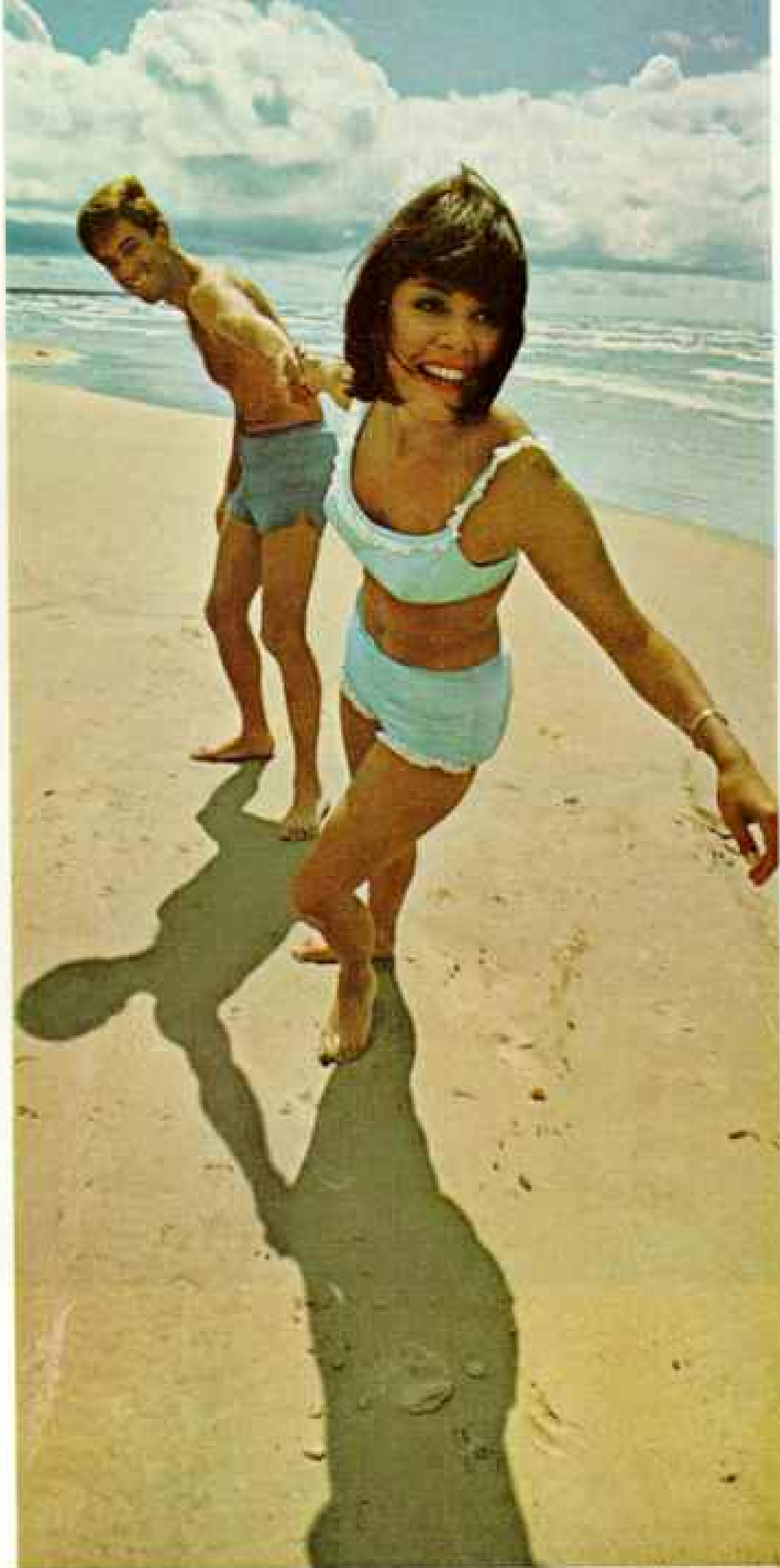
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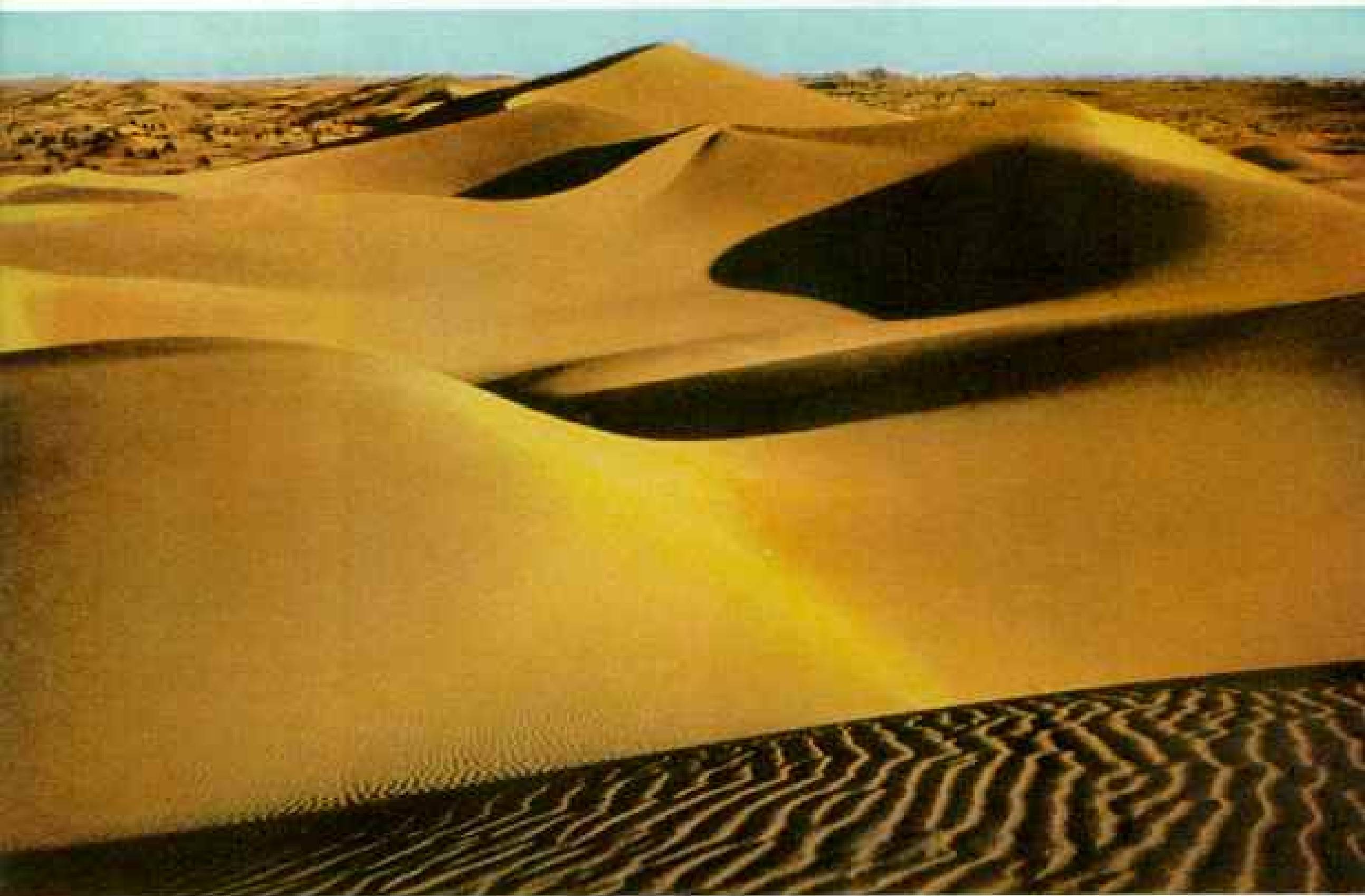
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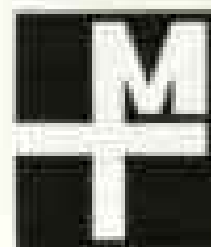
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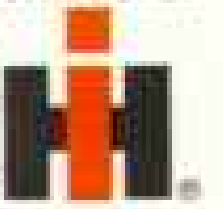


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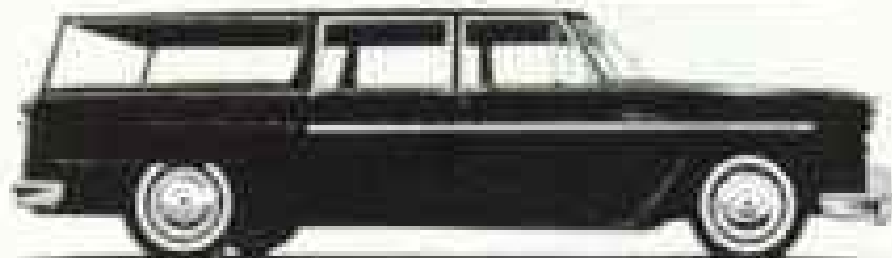
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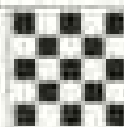


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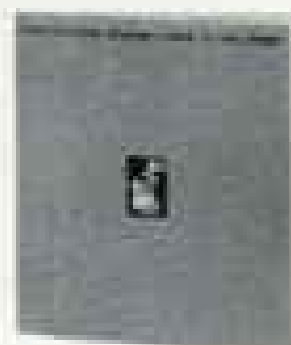
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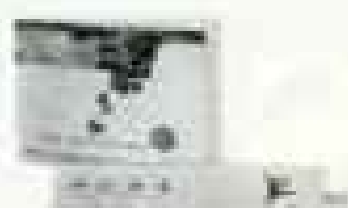
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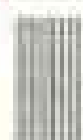


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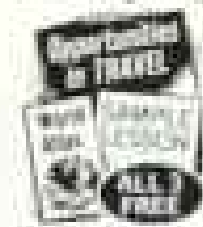
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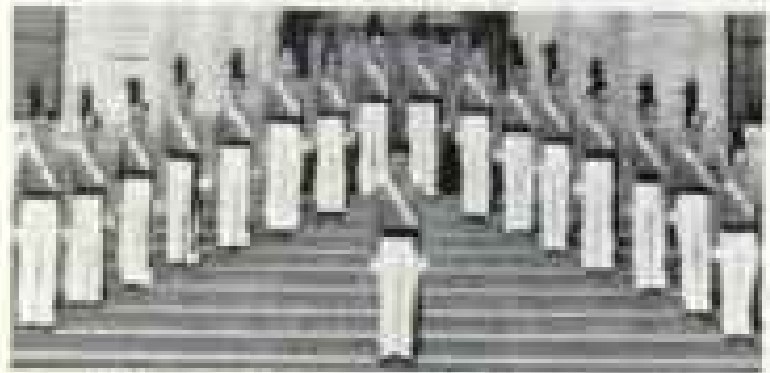
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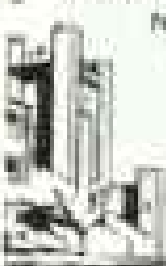
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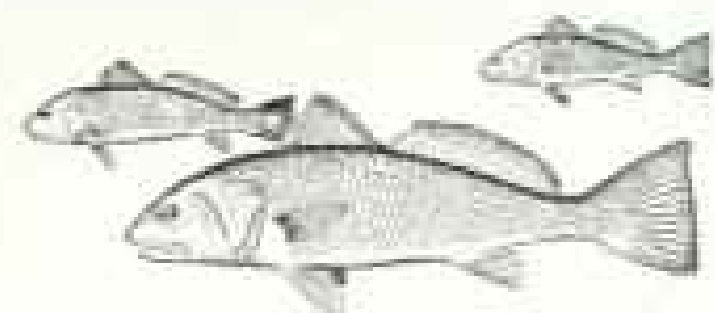
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# The town that put up the fight of its life---for its wildlife.



Man would die if it weren't for the life-line that ties him into nature's cycle with the plants, animals and tracts of unspoiled land that support it all.

On the other hand, man is a multiplying, progressive being who needs more and more homes, buildings, roads and farms that use up the natural land.

The people around Naples, Florida, fought right through the middle of this dilemma. Their battlefield was 4,000 acres of land and water at Rookery Bay. This is a prolific breeding ground for the waters of the Gulf of Mexico, where sport and commer-



cial fishermen get more fin and shell fish than are caught on our West Coast, Alaska and Hawaii combined. Suddenly the area was a real estate target. The word got out, the alarm went up, and the citizenry put up the battle that saved the birds, fish and other wildlife. It also proved that America's real power grows from grass roots.

There were Mr. and Mrs. Lester J. Norris, who got things going by working out options on the land. There was Charles J. Draper, who pulled the effort together into a businesslike organization. George Vega, an attorney, got his neighbors to sign a 50-foot long petition to the County Commission.

A biologist named Joel Kuperberg enlisted willing help from state and private scientists. Nelson J. Sanford, a prodigious fund raiser, outdid himself for the cause.

Many more people and many organizations joined in. Only private funds were solicited. The Nature



Conservancy helped with details on how to organize. The National Audubon Society helped purchase the first 1,600 acres and now maintains this tract. Soon, the sanctuary area will include all 4,000 acres, its wildlife and natural beauty undisturbed.

As a company long dedicated to conserving natural resources, Sinclair would like to send you other examples in which private citizens won similar battles. Write Sinclair Oil Corporation, Room 2210, 600 Fifth Ave., New York, N. Y. 10020.

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